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THE
DENTAL COSMOS:
A
MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY
EDWARD C. KIRK, D.D.S., Sc.D.

Observe — Compare — Reflect — Record.

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As always yours
L. Foster Flagg

THE DENTAL COSMOS.

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No. 1.

ORIGINAL COMMUNICATIONS.

THE SCIENTIFIC METHOD IN DENTISTRY.

By EDWARD C. KIRK, D.D.S., Sc.D., Philadelphia, Pa.

(Read before the Northeastern Dental Association, at Boston, Mass., October 21, 1903.)

ANYONE who has given at least casual attention to the literature of dentistry or who even has kept in touch with the thought of our profession by attendance upon dental society meetings must have observed how frequently it happens that a speaker or writer expresses his lack of confidence in the observation of a co-laborer in the professional field because, as he usually expresses it, it is "only a theory," or it is "one of those scientific things for which the practical man has no use."

Indeed, this attitude toward the scientific method is not infrequently expressed as downright contempt, the critic invariably priding himself upon the fact, or at least upon his assertion, that he is a "practical man." There seems to be a widespread feeling that the scientific method in dentistry is a sort of mental jugglery by which certain men find diversion in mystifying others who have no taste for that kind of entertainment.

I do not think I have overdrawn the situation, for the belief seems to be quite general that there are two aspects to

dentistry—one denominated "theory" and the other denominated "practical." It is voiced generally by state boards of dental examiners; it is the current belief of dental students. Dental college faculties are by no means blameless in this connection; it is the bane of the teacher and the greatest obstacle which he encounters in training students for the intelligent practice of dentistry. Student, teacher, and examiner are each in some degree contributing to the fundamental misconception of the impracticality of science by the use of such expressions as "He knows his theory very well, but is not up in the practical side," and the several adaptations of the same idea in forms suitable to varying conditions.

I frankly admit that my indictment sounds somewhat severe, yet I am compelled to assert my belief in its truthfulness, but in so doing I desire at the outset to explain that I am bringing this matter for your consideration in no faultfinding spirit, but rather for the purpose of critically investigating the causes of this peculiar attitude of mind in our profes-

sion toward the scientific method, to examine its etiology as it were, and if possible indicate its therapeutic treatment.

CONSERVATISM *vs.* PROGRESS.

First, then, we have to recall the fact that the history of the human race furnishes unlimited examples of the resistance which humanity opposes toward all changes in the existing order of things. No progressive step has been taken which did not meet with opposition; if founded in truth it has survived and wrought out its career of beneficence even though ignorance, superstition, or so-called conservatism, have for the time being retarded its development.

The gradual evolution of truth, the discovery of facts, the correlation and organization of knowledge and its formulation in the exact terms of scientific record, have kept up an unceasing antagonism with that element of the social organizations which shrinks from advancement, which protests against the substitution of the new for the old, and which is content with things as they are. It is unnecessary to cite instances, as we are all familiar with the general fact, and history furnishes many classic examples where the protest of conservatism against the progress of scientific truth has been recorded in acts of bloodshed and homicidal vengeance.

The sociologist discerns in this internecine strife between the progressive and conservative elements of society a beneficent factor in the evolution of a stable body politic. The hostility with which new ideas are received has been characterized by Karl Pearson in his "Grammar of Science" as "the crucible in which the dross is separated from the genuine metal, and which saves the body social from a succession of unprofitable and possibly injurious experimental variations."

The subject, then, with which we are concerned is the nature of this progressive tendency which seems to arouse so much opposition in human society, and which manifests the same quality to a degree in the dental professional body.

The term "science" is one which has done duty in defining a number of widely divergent conceptions. It has been applied to purely speculative systems having no material basis, and it has been used to designate the art of the pugilist, but in the present connection the term is limited to its specific and recognized use, to designate knowledge founded upon ascertained facts which are universally accepted as such by all normally healthy minds. It will be seen that the essence of science is knowledge of the truth, and that the scientific method is a process having for its purpose the discovery of the truth, the unfolding of natural laws by inductive reasoning from the data obtained from methodical observation of phenomena. It differs from empiricism as knowledge differs from experience. In the early days of purely empirical medical practice applications of salves and ointments to abraded or denuded surfaces were made because of their "healing virtues," the phrase implying that the curative power was a property inherent in the application. Scientific study has shown that the curative power is the *vis vitæ* of the tissue, and that the function of the application is mainly to afford a temporary protection against irritation—a vastly different conception which has served in its general application to largely neutralize the one time superstitious reverence for the curative power of drugs and bring about their more rational use.

The scientific method in dealing with phenomena includes first of all methodical observation, not only of a particular aspect but of all the collateral or correlated factors, secondly the orderly arrangement of the observed data, and finally, by inductive reasoning, the formulation of the cause, *i.e.* the natural law involved therein.

It is the application of the scientific method to the material problems of life that is responsible for the immensely improved circumstances which characterize the social conditions of humanity in the present generation as compared with previous generations; scientific development and social progress are interchangeable

terms, or, as Professor Clifford has expressed it, "Science is progress."

AN ILLUSTRATION FROM THE HISTORY OF DENTISTRY.

What is true of human society as a whole is true of its specialized activities in any department. The progress made in dentistry is measurable by the degree to which it has utilized the scientific method. To the extent that we have followed empirical modes of practice have we failed to advance—nay, worse, we have retrograded. I venture to say that in this audience there are those who easily remember that it was at one time the accepted belief that decay of the teeth was caused by lateral pressure of their approximal surfaces. I presume my friend the "practical man" is at once prepared to say, "Well, that is one of those theories long ago exploded which goes to show the truth of my contention that theories are not practical." But let us examine the matter a little more closely, and see whether that conclusion will respond to the test of scientific validity.

The lateral pressure hypothesis was founded upon just two observations as premises: First, that teeth in close contact decayed on their approximal surfaces; second, when teeth were not in contact they rarely if ever decayed upon their approximal surfaces. *Ergo*, the conclusion: Approximal contact (or, as then expressed, "lateral pressure") causes decay.

Of course we know today that the deduction was faulty because it failed to take into account all of the phenomena of the carious process. The lateral pressure idea was therefore not a theory at all, but a conclusion deduced from the observation of a single phenomenon; it was based upon experience and not upon knowledge and reason. In short, it was not science, but empiricism; not a theory, but a false conclusion.

Now, I have said that as we have followed empirical methods we have not only failed to advance, but have retrograded. What does the record show regarding the empiricism of the lateral pressure craze in connection with dental

progress or otherwise? Assuming the conclusion to be sound, the practical men of dentistry who had seen with their own eyes teeth decay on their approximal surfaces straightway adopted as their accepted mode of practice the wholesale mutilation of teeth, destroying their form and functional usefulness by sawing them widely apart to secure "self-cleansing separation," thereby causing the ultimate loss of the teeth so operated upon by inducing degenerative processes in their retentive tissues, disorganizing the occlusion, and bringing about pathological disturbances of the pulps; and, after all, failing as a rule to arrest the progress of decay.

Nor did the separatists confine their activities to the mutilation of approximal surfaces, for numberless sound teeth were removed, the principal molar being the usual victim, in order to relieve lateral pressure and overcrowding of the denture.

As a prophylactic method the system was a signal failure.

Then came the revulsion of sentiment. What empiricism had failed to accomplish the scientific method undertook to do, and did do, by investigating the phenomena of caries and correctly reasoning out the problem of its cause, so that the art of operative dentistry was ultimately placed upon a scientific foundation. The practice of filling teeth was revolutionized, so that today we not only know how to fill teeth successfully, but why the older practice was unsuccessful in comparison with the practice of today.

The practical application of the lateral pressure delusion to operative dentistry was separation by mutilation; the practical application by the scientific method is expressed in the dictum of Black that "The marginal lines of a cavity must be laid upon areas of relative immunity to the attacks of caries-producing organisms in order to prevent a recurrence of decay," or—as it has been epitomized—"extension for prevention."

Compare for a moment the significance of the two conclusions, the ancient empirical error and the modern scientific truth; one a generalization based upon

scarcely more than a single fact and leading to an absolutely erroneous mode of practice, the other the practical embodiment of the etiology of dental caries as it has been discovered through scientific research, and the key to its successful treatment in so far as that is possible by filling methods. The ideal of one is mutilation, of the other restoration.

But my practical friend may still contend that the method of experience and empiricism is after all valuable, for it was largely through practical test of the old lateral pressure idea that we were driven to a closer study of the problem of tooth-decay, and so developed our knowledge of the better mode of practice. The answer to that contention is found in the wasteful expenditure of time and the human suffering and the mutilation of vital tissue involved in the experiment, which if it have any ultimate value at all as an experiment is of a negative rather than of a positive character. It is quite analogous to the value which the small boy claimed for pins in a composition which he had written upon that topic, and in the course of which he made the surprising statement that "pins had saved thousands of lives." When asked by his teacher how he could assert that pins had saved thousands of lives, he replied, "Why, by not swallowing them!"

THE SCIENTIFIC METHOD IN ORTHODONTIA.

The practice of dentistry furnishes another conspicuous example of the value of the scientific as compared with the empirical method. Until within a very recent period the study of malpositions of the teeth was a chaotic and bewildering mass of detail. For two centuries at least the point of view was absolutely empirical in the study of this important department. Each case was a special problem, it was said, and as the expressions of malposition apparently varied with each case, ponderous tomes of many pages would scarcely contain the detailed descriptions of the methods and fixtures which have been successfully reported and advocated for their treatment. To those of us who came into dental prac-

tice twenty-five years ago the most discouraging problem was that presented by the department of orthodontia. The attempt to study orthodontia from the cases and appliances described at that time was not unlike the attempt to acquire a knowledge of the Chinese written language, where every word has its individual graphic symbol. It was a mass of detail with no connecting system or order. But in due course this confusing mass of data was made the subject of investigation in a methodical way. The scientific method was applied to its solution, and the underlying principle of the aberrations from normality in the positioning of the teeth was evolved in Angle's dictum that the problems of orthodontia are problems of malocclusion, and that the essential object of orthodontic treatment is restoration of the normal occlusion. That was the first step in bringing order out of chaos and the touchstone that opened up the next generalization, viz, that malposition of the first permanent molar is the principal factor in the causation of malocclusion of the dentures.

The problems of orthodontia have not all as yet been brought within the limitation of a scientific formula by any means, but the scientific method is at work upon them, and the first and most important steps have been taken to reduce the data of orthodontia to system and logical order. And what is the practical result? The difficulties presented by an infinite variety of cases have been reduced to the problems presented for solution by a few fundamental types. The treatment of cases is undertaken with intelligent understanding of their etiology, consequently with increased assurance of permanent success. Recognizing the cause, our treatment is directed toward its removal—a method in orthodontia work not generally possible before Angle's classification. And finally, the bewildering array of regulating fixtures that stand as recorded evidence of our ignorance of the principles of orthodontia are relegated to the lumber-room of antique and useless ideas, while their place is being taken by a few typical fixtures de-

signed with reference to the classes of irregularities in occlusion which they are intended to correct and do correct.

I could take more of your time in presenting examples in other departments of our professional work, illustrating the fact that our progress has been due to the application of the scientific method to our professional problems. I have said enough, I am sure, to make clear to you just what I mean by the scientific method, and to illustrate its value—nay, more, its absolute necessity in our work. Let us not be misled by the pseudo-science, empiricism, or ignorance which often masquerades as science. We need to avoid all false doctrine, heresy, and schism in our search for scientific truth as well as in our theology. We must have clear notions as to what science and the scientific method are, and not only cultivate the habit of mind which they produce, but also promote the same understanding and cultivation in the agencies which are forming the professional body of the future.

TEACHERS MUST BE UP TO DATE.

The schools are our most important consideration in this connection. We must understand always that the school is its corps of teachers, and that everything else in the institution is merely accessory thereto. No man should be permitted to teach, to form the habits of mind, the ideals, of the recruits of our profession who has not in some way obtained that breadth of training which means not only knowledge of the data of science but scientific culture as well. It is not what he teaches so much as how he teaches that indicates his fitness and determines the type of practitioner he creates. In proportion as the teacher

uses the scientific method does he eradicate from the minds of his students the empirical method and improve their mode of practice by putting it upon a rational basis. He substitutes intelligent skill for rule of thumb, and improves the "how" by creating an interest in the "why." Many who are in full sympathy with the principles here advocated complain with much show of justice that properly trained men capable of fulfilling the cultural specifications advocated are so few as to be inadequate to the demand. Then the schools should make them! There never has been nor never will be any difficulty in supplying a demand of that character if both the dental profession and the public will create the demand. The great difficulty is to make it evident that the demand should be made. As long as a fair proportion of those in our own ranks are content with things as they are, as long as there are those who claim that theory is impractical, as long as there are those who practice dentistry only for what they can get out of it and who have no real love for it, so long will they be content with the empirical method, and so long the demand for more intelligent practice, broader culture and the scientific method in our educational work will not be made.

I have endeavored to show that as we have evolved the principles which underlie our art we have simplified its practice and made it rational, and proportionally successful. If, then, my contention is borne out by the facts, an aggressive application of the scientific method to our educational system must bear a golden harvest in future professional progress to which that of the past would be as the creeping of the child to the vigorous stride of the man.

DISINFECTION OF DENTAL INSTRUMENTS WITH FORMALDEHYD.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin.

THE very numerous observations and investigations of the last ten to fifteen years in the domain of the pathology of the mouth and teeth have led to the ultimate conclusion that the same principles of cleanliness and asepsis which form the basis of modern therapeutics must be observed in dental surgery no less strictly than in general surgery.

In the matter of carrying out these principles we have also come to the unanimous conclusion that the best means of bringing about an approximately sterile condition of the hands consists in a *thorough mechanical cleansing* assisted by the application of some non-irritating antiseptic, such as spirit of soap or five per cent. solution of lysol, and that instruments may be absolutely sterilized by boiling for from two to fifteen minutes in a two per cent. solution of soda. We have also found that instruments may be sterilized with a fair degree of certainty by immersing them, after mechanical cleansing, for thirty minutes in a five per cent. solution of lysol.

There are, however, many instruments, mirrors, handpieces, etc., as well as various materials, which cannot be boiled, or even bathed in an antiseptic every time they are used, without being more or less injured thereby. For such objects, as well as for sterilizing in general, Rosenberg recommended formaldehyd, and he constructed an apparatus in which the objects were subjected to the vapors arising from a bath of *holzin*, a solution of formaldehyd in methyl alcohol with the addition of a certain percentage of menthol to prevent too rapid evaporation. This method of sterilizing did not enjoy much popularity, and at present is

scarcely made use of at all. In place of it a new method has been recommended by Percy Simundt of Berlin which appears to me to be free from some of the disagreeable features connected with Rosenberg's apparatus.

THE SIMUNDT PLAN.

The Simundt apparatus consists of a flat metallic box into the bottom or sides of which a receptacle for carrying the antiseptic is fitted, being separated from the box itself by wire gauze. This receptacle (or receptacles) is filled with disk-shaped porous bodies impregnated with formalin. The vapors of formaldehyd given off penetrate into the box and sterilize its contents, whatever they may be.

It has been claimed for this apparatus that the sterilizing of instruments is effected in thirty seconds. This, however, is a mistake. Large burs which had just been used in boring out freshly extracted teeth were hastily brushed, rinsed in pure water, dried, and placed in the Simundt apparatus; and although they were sometimes found to be sterile in five minutes, it usually required a much longer time, and occasionally as much as three-quarters of an hour, so that in practice we would hardly consider the sterilization complete under less than an hour. Excavators, chisels, and other smooth instruments, to which infectious matter does not so readily adhere, are much more quickly sterilized than burs.

For the rapid sterilization of instruments in general the formaldehyd is decidedly inferior to boiling, and personally I do not find that it has any material advantages over the five per cent. solution of lysol. For such instruments, however, as may not be boiled or even

repeatedly bathed in lysol, as well as for sterilizing cotton, bibulous paper, etc., I have found a welcome help in the apparatus of Simundt.

Mirrors may be left in the apparatus over night even, and will be undoubtedly sterile in the morning, the only drawback being that the metal loses its polish, or may even become discolored. The hand-piece of the dental engine may also be rendered externally sterile by leaving it for from one to two hours in the apparatus.

Wads of cotton or bibulous paper which are rolled together between the fingers will seldom be found to be sterile. I have been in the habit of preparing a large quantity of them, soaking them in a solution of thymol in alcohol, drying and keeping them in a box free from dust; we then have them not only aseptic but antiseptic. The sterilization by dry heat is unsatisfactory.

I have also found that it suffices to place a formalin tablet in the box containing our cotton or paper wads to keep them constantly sterile. The tablet gradually loses its strength, and must be replaced by a fresh one about every five to six days. The sterilization takes place much more rapidly (inside of an hour) when the wads are placed in the Simundt apparatus. Our silk ligatures, also, which are not generally sterile, may be made so in the manner just described.

In making root-treatments many dentists cleanse the canal by means of cotton wrapped around a thin broach—in fact, this is often the only feasible way. In wrapping the broach we use our fingers, which probably have before been in the patient's mouth, maybe several times, and carry great numbers of bacteria. No one, of course, could expect such broaches to be sterile. If we wish to operate with sterile broaches the only way is to prepare a large number beforehand and sterilize them by heat or by impregnating them with a solution of some antiseptic in absolute alcohol (which will not rust the needle), or keep them in a box with a tablet of formalin, or, finally, put them for from one to two hours in the formalin apparatus. If left in long the

cotton becomes brittle and adheres to the needle.

It is claimed to be an advantage of the formaldehyd sterilization that it does not in any way injure even fine-edged instruments. This statement must be taken *cum grano salis*. Any instrument which is not perfectly dry rusts profusely; perfectly dry ones do not seem to suffer if left in for only an hour; left in for days they will rust very decidedly—so that we must conclude that a slight action takes place even on dry instruments.

STERILIZATION OF NAPKINS, ETC.

Another question which comes up relates to the linen (napkins, towels, etc.). A communication by Clarkson and Hayden (*Dominion Dental Journal*, March 1903, page 166) runs as follows: "First we decided to try if the ordinary linen as we get it from the laundry, is really aseptic. Accordingly, with a pair of scissors and a pair of pliers, both absolutely sterile, we snipped a piece out of the inner folds of a towel and lodged it with every precaution on top of some sterile glucose agar, pressing the particle gently against the surface, and replaced the sterile cotton plug in the test tube, everything having been previously sterilized except the bit of linen. Then with the same care we cut a bit of fringe off the same towel (this towel had been lying in the locker for a week or more, but had never been used). Of this we made a stab in some agar medium, pressing it with a sterile needle down to the bottom of the test tube, so that it would be away from oxygen. The two tubes were placed in the incubator and watched daily, but even at the end of the seventh day there was no sign of any growth whatever. This we are pleased to think goes to prove that we can depend upon our laundry really being sterile, as germs of any kind had every chance to develop if they were present."

But surely we cannot be expected to look upon this result as conclusive. It is very soothing to the conscience to think that the napkins which we stuff into patients' mouths are sterile; but this is not the case under ordinary circum-

stances. Let us suppose that at the laundry the napkins, towels, etc., are really boiled sufficiently long to make them completely sterile. They are then rinsed in water which as a rule is not sterile; it may be far from being so. Then come the drying and ironing or mangling, which are by no means carried out aseptically. During these processes the linen accumulates few or many bacteria depending upon the conditions under which the said processes are carried out. In regard to the application of heat by the hot iron: how thorough this may be, and whether the heat be sufficient to devitalize bacteria, we do not know; that will depend upon the laundress or the state of her fire. Especially the wash from Chinese laundries might give us food for reflection in this connection if it is true as reported, that they sprinkle their wash with water which they squirt out of the mouth in the form of a fine spray. But if the wash came from the iron perfectly sterile, the subsequent handling and exposure to air and dust entirely destroy all foundation for any hope that our linen is bacteriologically sterile. It may be, but usually it certainly is not, as I have not only deduced theoretically but determined experimentally.

Napkins may be sterilized with certainty in the formalin sterilizer or by keeping a strong formalin tablet in the box with them. I can, however, hardly recommend this procedure, since the napkin becomes impregnated with the vapor, and in sufficient amount to have an irritating effect upon the mucous membrane of some patients.

However, in regard to the dental linen, especially the napkins, we should above all things see that they are washed by

healthy and cleanly people, and that they do not get into the hands of persons suffering from syphilis, tuberculosis, or other equally dangerous infectious diseases. The laundress should be instructed as to the extra precautions to be taken. We have far less to apprehend from such bacteria as may fall upon the napkins from the air; these we are constantly taking into our mouths, anyway, with the air, food, and drink in much larger numbers than we introduce on a napkin—from which we are, however, not to draw the conclusion that the napkin should not be kept as free from contamination by handling and by dust as is possible.

The dentist encounters great difficulty in carrying out a perfect asepsis in his instrumentarium, since he operates with so many instruments and changes his patients so often that it is no little matter to sterilize them all before every operation. Instruments sterilized the day before cannot be counted upon as absolutely sterile, on account of the dust of the operating room penetrating into the drawers of the instrument case. I have been able to overcome this difficulty in a very simple manner by placing a formalin tablet in each drawer of my instrument case and renewing it from time to time (about once a week). The drawers remain constantly sterile and the quantity of formaldehyd vapor which is developed is not sufficient to in any way contaminate the air of the room.

Of course the dentist should see to it that the knobs on his instrument case, as well as those parts of his operating chair with which he is obliged to come into contact with his hands during an operation, should be kept in a clean if not in an aseptic condition.

THE CARE OF THE TEETH OF THE SICK POOR.

By WILLIAM H. POTTER, D.D.S.,

ASSISTANT PROFESSOR OPERATIVE DENTISTRY HARVARD UNIVERSITY.

(Read before the Northeastern Dental Association, at Boston, October 21, 1903.)

THAT sick people need dental care is well understood by every practitioner. Illness favors, in many ways, dental diseases. It lowers general vitality and reduces the resisting power of tooth tissue, giving its enemies a chance to work to advantage. During an illness the mechanical cleansing of the mouth is much abated. The saliva is less active, and the movements of the tongue, lips, and cheek much impaired. As a consequence, remnants of food remain long in contact with the teeth and surrounding parts. It is not strange, then, that a prolonged illness is almost sure to bring about trouble of one sort or another with the teeth.

If the sick person has the means to employ a dentist at this time, great relief can be obtained, and a very serious obstacle to the progress of recovery can be removed. Probably no service which the dental practitioner renders is more appreciated than his visits to his patients when they are confined to their homes by a prolonged illness. At no time does the patient feel his dependence upon the dentist's care as then. Bodily comfort and sometimes recovery itself are only possible through what the dentist may be able to do in the sick-room.

If this service is so necessary to the comfort and well-being of our patients, how about the sick poor who need the service just as much, but who as a rule are unable to get it? When I speak of the sick poor I mean those who are confined to the room by serious illness, who are unable to go out to an infirmary for the relief of pain of dental origin. Think of such an one who must endure, in addition to a general illness, the severe pain

following inflammation and death of a pulp and a resulting alveolar abscess. To be sure, after days of pain, when the pus has bored through bony walls relief comes at last with the spontaneous opening of the abscess. This natural cure is, however, a severe ordeal to a well person, and a vastly greater one to a sick person. What, then, can be done for these unfortunate people?

CHARITABLE SERVICE INAUGURATED BY HARVARD DENTAL SCHOOL.

I wish here to describe an attempt to meet the evident need of dental care among the sick poor, with which I have had much to do during the past six years. The work has been accomplished in connection with the Harvard Dental School. We began by picking out about a half-dozen of our best and most experienced students and giving them special instruction in the bedside practice of dental operations. They were formed into what was called an "Emergency Corps," and held themselves in readiness to respond to all calls which might come for outside service. A small card was printed and distributed which read as follows:

A Free Dental Service for the Sick Poor at their Homes.—Sick people are often great sufferers from affections of the teeth and surrounding parts, and in many cases are unable to leave their homes for treatment, and are therefore practically without skilled help. To meet this condition, the Dental School of Harvard University has established a service consisting of a corps of men prepared to visit the sick poor at their homes and relieve pain arising from dental disorders. This service does not contemplate the filling of teeth or making of plates, but simply the relief of pain, expecting that, on recovery of the patients, they can personally visit the Infirmary and

Oral Hospital of the Harvard Dental School and have such further attention as may seem advisable. For the present this work will be limited to the city proper. It can be obtained by calling on the "Emergency Corps," Harvard Dental School, North Grove street, Boston, either by telephone or by letter.

This card was sent to all the hospitals in Boston, to all the divisions of the Associated Charities, to the city missionary societies, and to many individuals who were known to be interested in the welfare of the poor.

You will notice the scope of the work: its main object is the *relief of pain*. It was not considered feasible to perform extended dental operations, as the insertion of fillings or the making of artificial dentures, but simply to remove if possible by appropriate means the distressing symptom of pain, expecting that at a later time, upon the recovery of the patient, further work could be done at the Infirmary.

Let me dwell a little upon the outfit of instruments which we send out with the operator upon these calls. First as to that most necessary of instruments, the extracting forceps. There are four provided, as follows: an upper universal molar, for the extraction of upper molars with fairly well preserved crowns; an upper root-forceps, bayonet shape, which serves for the extraction of roots of upper molars and also of the bicuspid and six anterior teeth. For the lower jaw, a lower universal molar forceps and a lower root-forceps, these two doing all the work upon the lower jaw. Other forceps would undoubtedly be valuable, but these four make an excellent set. For the treatment of teeth which do not require extraction are provided a pair of dressing pliers, an examination point, two or three excavators, two enamel chisels, a twist drill for gaining entrance to the pulp through a filling or through tooth-substance, a piano-wire broach for work upon the pulp-cavity, a mouth-mirror, a gum lancet, and a syringe. The syringe is a very important part of the outfit, being used to wash out sockets after extraction, and cavities of decay which are under treatment. I wish to call your attention to the kind of syringe

which we put into the outfit: It is an all-metal one which was imported from Berlin for this use. It is efficient, and—of great importance—it is perfectly cleanable.

The medicine case contains carbolic acid 95 per cent. solution, a mixture of oil of cloves and chloroform equal parts, a mixture of tinct. ac. rad., tinct. iodin, and chloroform equal parts, and a bottle of sandarac varnish.

By the aid of the instruments and medicine case it is possible to extract teeth, to treat exposed or nearly exposed pulps, to open into a pulp-cavity and give vent to a dead pulp, to wash out a pus cavity, and to insert a temporary dressing of cotton and varnish. The ordinary pain-producing dental disorders can therefore be treated by the outfit described.

TWO CASES SHOWING THE PLAN IN OPERATION.

Let me cite two cases to illustrate the nature and importance of the work among the sick poor carried on by the "emergency corps." About three years ago, in the middle of the summer, an urgent call came to see a patient at the Boston Lying-in Hospital. One of the emergency corps promptly responded, and found the case to be that of a colored woman who had a few days before been operated upon by Cæsarean section for the delivery of a child. Everything seemed to be doing well until an elevation in temperature was noticed. A very important question now arose as to the cause of the high temperature. The house officer in charge had suspected some trouble with the patient's teeth, and thought that possibly the high temperature might arise from that source. It was of the greatest importance that it be known at once whether the disturbance was of *dental* or *abdominal* origin. Hence the appeal to our emergency corps. A careful examination of the patient revealed a beginning alveolar abscess, and the tooth involved was extracted under ether. The abnormal temperature disappeared on the following day, and a very important

point was thereby cleared up. No one could doubt the value of this dental service to the sick colored woman who had endured a surgical operation of the first magnitude.

Another case of a different nature is as follows: On February 2, 1903, I received the following letter:

January 31, 1903.

Dear Dr. Potter,—Dr. B. has suggested that I should ask if it would be possible for you to send a dentist from the School to a Mrs. H., whose teeth are in great need of treatment. She is a most worthy but very poor woman, who is confined to her room, having met with a severe accident a few years ago, the result of which has been the amputation of one leg.

She is supported by the Widow's Aid Society, earning now and then a very little money by sewing. As there is no way of her going to the Dental School or to any dentist, Dr. B. thinks it is a case to which you can send relief. I cannot tell you what is necessary to be done beyond the fact that she cannot wear her plate, and I believe one or two teeth should be extracted. Should you need any further testimony regarding Mrs. H., I am sure Dr. M., whose patient she is, would tell of her worthiness.

Trusting you will be able to send someone before long to her, and thanking you for taking any trouble this may give you,

Believe me, very cordially,

S. M. B.

On receipt of the above, one of our emergency corps men was sent to see the case. The needs of the patient were attended to, the treatment extending over a period of some weeks. After completion of the treatment the following letter was received:

June 18, 1903.

Dear Dr. Potter,—A few months ago I wrote asking you if it would be possible for you to send a dentist to Mrs. H. May I thank you now for the great kindness you conferred by sending such an efficient man, who has done

excellent work and has made this poor woman who is confined to her room so comfortable? She cannot express her gratitude for all he has done, and I wish to add my testimony and tell you of his kindness to Mrs. H.

Thanking you for all you have done,

Believe me, very cordially,

S. M. B.

The work done by our emergency corps, though maintained during vacation and term time alike, can reach only a small fraction of the cases in need. In some way, work of this sort should be extended in its scope so that the sick poor of our city should have the benefit of the skill of dental practitioners to the extent that they already have the skill of medical practitioners. Dentists can thus take part in medical charity, and show their willingness to perform gratuitous service to the worthy poor. Such service is sorely needed, and is always thoroughly appreciated both by the patient and by the public which hears of its performance.

At present most if not all the charitable dental work of our city is done through the agency of the dental schools. But this should not always be the case. There should be associations of practitioners outside of dental schools who would agree to give a stated portion of their time during the month or year to the worthy sick and unfortunate poor. Such associations are especially needed in the smaller cities and towns where no dental schools exist, and where the community has no organized institution to minister to the poor. No liberal profession can gain and retain the respect of the community unless it is willing to set aside a certain portion of its professional skill as a free gift.

THE BRIDGE IN PYORRHEA.

By CLARENCE J. GRIEVES, D.D.S., Baltimore, Md.

THAT lesion of the alveoli and associated soft tissues commonly known as pyorrhea alveolaris is now clinically so frequent as to be "the expected" rather than "the extraordinary." So much is this the case that we rarely pause to wonder at the seeming helplessness of these tissues; for apparently—and with good reason—they do not possess the inherent power usual in other osseous tissues of the organism to ward off the insidious onset of this disease.

Why should not disarticulation of the several phalanges, which make up the intricate mechanism of the hand and foot, with necrotic degeneration and its microbic accompaniment, be just as common as a similar disarticulation of the teeth?

Within the perception of the writer there can be but one answer to this query: Were the hand and foot as little used for the purposes nature originally planned as is the denture, and were they exposed to a similar microbic environment, the surgeon, years ago, would have been expected to display not a little of that mechanical ingenuity he has too often despised in the dentist and to have substituted artificial fingers, the equal in utility and appearance of artificial teeth.

We take it for granted from a long line of clinical data and physiological experiment that the civilized denture is suffering primarily from a lack of that nutrition to be had only at the price of exercise, such exercise for which all parts of the maxillæ, the teeth and alveoli and their nutrient membranes were originally designed.*

The word "civilized" stands for a mul-

titude of sins and chronic conditions of the organism, not the least of which are those associated with the end-organs, the hair, the teeth, etc., made partially useless and unnecessary by luxurious living. Man wears a stiff hat, making useless the hair as the natural protector of the head and interfering with the circulation through pressure on the branches of the temporal and occipital arteries; and the hair follicles which these vessels supply, lacking nourishment, fall before the onslaught of the ever ready bacteria.

ETIOLOGY OF THE DYSCRASIA.

A good development of osseous tissue is dependent on its use, and man in these latter days rarely develops his osseous oral system as he does his other tissues to that state where it may not at some time be harried by microbic action, in a cavity where that action is always so imminent. The growing child in its efforts at mastication is supplied with so much solid food—meats tender from cold storage and bread lacking body—that he never learns true mastication, and soon the lazy habit becomes so confirmed that his periodontal membranes and periosteal tissues build neither stout fibers nor heavy alveolar walls.

Nature, ever economical, through marvelous arterial reflexes not only lessens nourishment to the parts little used, but actually resorbs deposited calcic salts to lay them up in the parts which work. Thus is permanently weakened a normally transitory structure, the alveolus—a structure subject to trophic change, adapting itself to two dentitions and disappearing in the finally edentulous.

The entire denture suffers not necessarily from malocclusion, but from the more common lack of occlusion, and the

* A. H. Thompson, "Malocclusion of the Teeth among the Ancient Peruvians," *Items of Interest*, July 1903.

old axiom, "A degeneration with every civilization," is proved again.*

The foregoing local conditions, which appear not impossible of correction, are further aggravated by those other general and vicious products of civilization and a lack of hygiene, viz, auto-intoxication, malnutrition, and lithemia. When we recall the proved deleterious effect of the toxins on the alveolar circulation, acting through the central nervous system, in the dyscrasia named: when we review the work of Kirk, Talbot, Rhein, and others, can we question for an instant that the predisposing cause of pyorrhea alveolaris lies in the so-called "comforts" of our civilization? †

In its very incipency this disease dooms the denture from the fact that the organs which it disables are not normally used, hence the alveolar and peridental circulation is disabled, nutrition diverted, and resisting power lowered, and an initial pyorrhea rapidly drifts into its more phagedenic forms.

SECURING IMMOBILITY OF THE TEETH.

That pyorrhea is in a degree amenable to local treatment, after or during the correction of the constitutional vice of which it is usually but a symptom, is the only excuse the profession has to urge in a pretense at its cure. In the light of the foregoing facts it would appear good treatment, after an exhaustive study of the systemic conditions and all possible correction of the same, and careful instrumentation, to make immovable all

defective elements of the denture so that it may be used in comfort.

To this end the conservative operator naturally looks to some form of splint—the best of which are those devised by Fish, Rhein, and D. D. Smith—in obtaining stability sufficient to promote a cure.

The resultant resistance to occlusion of such a device is not to be measured, any more than in bridge-spanning, by the weakest root unit, as is so commonly stated; on the contrary, from root-divergence, frequently the finished piece is stronger than many of its multiples.

It is doubted, however, if such splints, holding teeth apparently incurable with cusps in locking occlusion, particularly in the molar and bicuspid region, are wise. Unless the occlusion be rearranged, one defective element will disable the entire side, resulting in disuse and final exfoliation. There is no device which so thoroughly meets such trying requirements—splinting, replacement, and rearrangement of the occlusion—as the judiciously constructed fixed bridge. It is the most hygienic form of retention yet introduced and the greatest protection to the soft tissues. It enables the operator to remove impossibly lame teeth with interdental spaces a constant source of filth, disabling the entire denture, and to replace the same with dummies saddled for contact and cleanliness and contoured to protect the underlying muco-periosteum.

There can be no question that in the molar and bicuspid region, after pyorrhea is established the occlusion should be altered—following evolutionary laws of change to suit new conditions—from the deep to the flat cusping; this is possible only with the bridge, supplying occlusion when lacking, relieving it when excessive, and correcting it when irregular. We cannot do better than quote Dr. W. V-B. Ames (*Proceedings National Dental Association*, August 1901): "Within certain limits, in pyorrheal conditions when edentulous spaces need to be filled, the indications for cutting teeth off at a point near the gum line, properly forming roots, and constructing a bridge

* During the Spanish-American War, one of the first regiments in the Cuban field was compelled, owing to the tropical heat, to slaughter and eat its beef on the same day. The entire regiment refused meat, from sore gums, inability to masticate it, and the indigestion which followed, the soldiers much preferring the canned article. Except a fortunate few having wealth to afford tender cuts and ice-houses, the grandparents of these men ate such meat through a lifetime with no discomfort.

† E. C. Kirk, "A Contribution to the Study of Metabolism," *Cosmos*, July 1903. E. S. Talbot, "Interstitial Gingivitis." M. L. Rhein, "An Etiological Classification of Pyorrhea Alveolaris," *Cosmos*, October 1894.

fitted with extreme care and judiciously antagonized with the occluding teeth of the opposite jaw, are forcible in proportion to the helplessness of the case. This will be looked upon by probably a large majority as very radical and unjustifiable practice, but acting upon this belief for about five years has given me results which have been out of proportion to the outcome of less radical procedures."

DEVITALIZATION OF THE PULP.

It is a happy coincidence that every year brings the pyorrhea and bridge expert nearer a common ground in a unanimous insistence on devitalization of the dental pulp as necessary to the ultimate success of their specialties. To imply a doubt as to the ability of the average dental operator to destroy a pulp and properly fill a root-canal, making a complete and lasting operation, is to question seriously the status of the scientific operative dentistry of the day. The advantages of devitalization in bridge work, the better paralleling and technique, absence of sensitiveness, pulpitis, etc., are too obvious to more than mention. The consensus of opinion in regard to the value of the dental pulp in the adult seems to be in favor of its retention when healthy, in mouths free from pyorrhea and where the coronal portion of the tooth is to be preserved by operative dentistry.*

There is an old "saw" on the American Indian which goes, "The only good Indian is a dead Indian," and in pyorrheal mouths it has been noted that the only good tooth is a dead tooth, so called. Some years ago, M. L. Rhein insisted on pulp-devitalization as of value to the apical tissues in pyorrhea, possibly through induction of a collateral circulation. He was followed by Dr. J. Leon Williams with microphotographs showing a common source of blood supply to both pulp and peridental membrane, the inference being that devitalization of the pulp increased the supply to the membrane. But there may be a

better reason—one which it is hoped our microscopists may soon establish—and that is, the probability of slow degenerative changes in the pulp after its formative office ceases. Gradual atrophy in an isolated formative organ such as the dental pulp is almost to be expected, and the common blood supply would ultimately suffer.

Be these theories as they may, most excellent clinical results are to be had by devitalization and surgically clean root-canal filling in pyorrhea and in all cases where, after operative dentistry has reached its possibilities in coronal preservation, the crown or bridge is to be applied. So, if the writer might summon sufficient courage to add one more idea to the present apparently too numerous treatments in the cure of these lesions, it would be a plea for simplicity in following the time-honored surgical axiom, "Remove the cause and put the parts at rest," and he would present the following as his

ARMAMENTARIA IN PYORRHEA.

(1) A careful examination of the systemic condition and its correction if possible.

(2) Local instrumentation as taught by Dr. Riggs, and the hygienic practice of D. D. Smith, supplemented by but little medication except for surgical cleanliness.

(3) Pulp-devitalization and clean root-surgery as taught by M. L. Rhein.

(4) A careful study of the occlusion, particularly as to cusping, and relief of any undue strain by grinding.

(5) The application of a splint suitable to the case and hygienic in construction.

After the foregoing treatment, if the patient cannot masticate with comfort: A careful examination to locate the lame tooth, and *its immediate extraction*. A replacement of the lost organs and splinting of those *in situ* by judiciously constructed fixed bridges with dummies saddled for cleanliness and contoured to protect the tissues; all occlusal surfaces to be flat rather than high, particularly in the buccal region, so that the entire

* "Is the Dental Pulp Necessary in Adult Life?"—R. R. Andrews, M. L. Rhein, J. Leon Williams. *Items of Interest*, March 1901.

denture may do its *pro rata* of the work, but without undue strain.

In the first three precepts we have followed the first half of the old rule and "removed the cause." In the fourth and fifth we have "put the parts at rest." It is good physiological sense to presume that as soon as comfortable, and not before, will the patient do his part and by healthy mastication promote a vigorous circulation—assuring resistance to

disease and a firmer alveolus and periodontal membrane. To this end are the extraction and the bridge splint.

It is the writer's firm conviction that the return to health of a denture disorganized by pyorrhea can be more readily accomplished by cleanly fixed bridge work as a splint, and the healthy exercise which it guarantees to the teeth, alveoli, and associated membranes, than by any other known means.

A PLEA FOR THE LARGE MOLAR IN DENTAL PROSTHESIS.

By Dr. STEWART J. SPENCE, Chattanooga, Tenn.

IN nature, the human molar measures across its occlusal surface about seven-sixteenths of an inch, measuring about the same mesio-distally as bucco-lingually. In art, the molar usually measures about six-sixteenths of an inch mesio-distally and five-sixteenths of an inch bucco-lingually. The difference, therefore, between the occlusal area of the natural molar and that of art is about as 7×7 to 6×5 —that is, as 49 to 30—a great discrepancy on the part of art. The artificial bicuspid is usually about as broad as that of nature when measured mesio-distally, but very commonly falls short in the bucco-lingual measurement, being often only three-fourths and sometimes but two-thirds the correct width. When to this is added the fact that the artificial denture excludes entirely one large tooth, it is seen that the grinding surface of art is somewhat less than half that of nature.

The writer can well remember the surprise with which he gazed upon these diminutive molars in the infancy of his professional life. He gazed and wondered, but said nothing, supposing that since the manufacturers made them so there must exist some good reason why they created them so small—inscrutable and past finding out though it was. And this became an article of faith with him

—*simple faith!* Indeed, it was with a feeling of venturing upon heterodox and dangerous ground that he timidly began, in course of time, to discard the small molars from the sets of fourteen and substitute for them larger ones.

And now it transpires that a veteran of renown in plate work, Dr. L. P. Haskell, has been demanding through the journals why manufacturers make such small molars; and the answer has been that the profession at large calls for them. The profession at large has perhaps been governed by the before-mentioned article of faith. If any of its members have offered any scientific reasons for their choice, such reasons were not repeated in the reply made to Dr. Haskell. It is reasonable to infer that the profession called for them because the manufacturers made them, and that the manufacturers made them because the profession called for them.

Probably the root cause of this long reign of the small molar is that in the early years of tooth-manufacture porcelain teeth were made only for the metal plate, being attached thereto by solder, and that as very painstaking grinding was required to adapt the porcelain to the metal in such a way as to exclude oral debris, this fact furnished a fair excuse for the narrow tooth. The prac-

tice being introduced in this way, its years of use fixed it into a custom, and customs are tyrants whose dynasties often outlive the needs which called them into existence, in this case swaying the dentist's judgment when the advent of vulcanite removed the original reason for the use of the small grinding tooth.

ARGUMENTS ADVANCED FOR THE EMPLOYMENT OF THE SMALL MOLAR.

The only arguments put forth from a scientific standpoint in favor of the small molar, as far as the writer has heard, are (1) that it renders the vulcanite plate less apt to fracture, because permitting more vulcanite in proportion to porcelain, (2) that it is more incisive than the larger tooth, so cutting deeper in mastication, and (3) that the larger molar encroaches more on the room of the tongue.

The first of these three objections may be disposed of by answering that the vulcanite may be thickened and thus rendered sufficiently strong. Nor is there any difficulty in doing this, because these fractures are most apt to occur where alveolar absorption has made room for an abundant thickness of vulcanite—that is, at the buccal surface, and where restoration of contour is needed to avoid sunken cheeks. Indeed, the fact that plates are often deficient in bulk at these regions is an argument in favor of the large molar, seeing that its greater size tends to fulness here. And this it does without interfering at the same time with a correct position of the tooth for masticating purposes—as does not the small molar.

To explain: In positioning an upper molar on a plate two desiderata should be aimed at; first, the support of the cheek by placing the tooth as far outward as is well possible, and, second, the stability of the plate during mastication by placing the tooth as directly under the ridge as is well possible. Now, it is obvious that these two conflicting desiderata cannot both be obtained by the use of the small molar, because of its narrow diameter bucco-palatally. So that if it be kept snugly under the ridge in order to

obtain stability of the plate during mastication there results depression of the cheek, and if it be extended outward to prevent this depression the result is that its palatal cusps, on which the burden of mastication falls, are positioned out from under the ridge and the plate consequently becomes liable in biting to tilt loose on the other side of the mouth. The greater breadth of the large molar more nearly allows the attainment of both these desiderata.

The large molar also tends to prevent another too common error in plate work,—the unduly closed bite. I think most of my readers will agree that more plates present with bites too close than too open. In these cases the molars are usually to be seen protruded toward the cheek, more inclined than perpendicular to the ridge, and so nearly on a level with adjacent vulcanite surface that the portion of it which extends toward and over the tuberosity sometimes does more service in mastication than do the misplaced and diminutive molars. The anterior teeth are similarly protruded, thus bulging out the lip as shown in pictures of Washington, while being scarcely if at all ever visible, and obliterating all traces of Cupid's bow which time may have spared, while at or near the angles of the mouth appear deep wrinkles formed by the tissue folding at each of the unduly deep closures of the jaws. To add to the unsightliness, the bicuspid (and of course the molars) are too prominent, giving the appearance of a mouthful of teeth. In biting, these plates are more easily loosened than those whose teeth lie more nearly under the ridge. The large molar, by obstinately objecting to being pushed thus far from its proper position on the ridge, tends to prevent in the hands of the unskilful workman this undue closing of the bite.

THE SECOND ARGUMENT.

The second of the three above-mentioned arguments—that small molars are more incisive—is more plausible. Its advocates argue that it receives weight from the fact that the full power of the muscles of mastication cannot, as Dr.

Black has shown, be employed with teeth set on plates, because of the discomfort caused the membrane by heavy pressure, and they claim that the bites of the smaller tooth, under this lesser pressure, masticate the food better than those of the broader tooth, because they are more penetrating. Some go so far as to say that the larger tooth increases this discomfort to the membrane in proportion to its size; but this is surely erroneous. It is easy to understand that a diminution in the size of the plate may increase this discomfort, but how the size of the tooth can affect the matter, seeing that the tooth merely conveys the pressure, is—at least, to the writer—incomprehensible.

But that a small body will penetrate more readily than a large one is of course self-evident, and if other things were equal this would be a weighty reason for using the small molar; but there is another factor in the calculation, equally self-evident, namely, that the smaller tooth fails to include in its grasp at occlusion so large a quantity of food as does the larger one. With food difficult to penetrate, such as leathery beefsteak, this fact might be but little argument in favor of the larger tooth, and perhaps the small molar might be indicated; but most food is not very difficult to crush, and *the danger is not so much that it will not be bitten into deeply, as that it will not be bitten at all*. Corns of maize, for instance, are easily crushed by a single bite; but that they do not always receive even this single bite is evident from their not infrequently passing through the alimentary tract unbroken. Such fruits and vegetables as are commonly eaten uncooked, e.g. apples, celery, radishes, and onions, are very apt to be gulped without sufficient crushing, and yet are not difficult to crush if only they are once gotten between the teeth.

And it is, in the writer's estimation, more important that vegetables should be crushed in mastication than flesh. This he infers from the fact that the carnivora chew their food but little, the herbivora much. It is probably more

dangerous to swallow an unmaستicated piece of onion than an unmaستicated piece of beefsteak. The writer knew a young girl who for nine days carried a slice of dried peach in her stomach, then vomited it. Would a piece of the most leathery beefsteak have stayed there undigested that length of time?

But more: of late years a new factor has entered into the problem. Bonwill has shown that small molars render scientific articulation impossible. He has taught us that at each lateral movement of the mandible the cusps of the molars and bicuspid will, if properly articulated, remain in contact with opposing teeth, and in order that they may do so the teeth of one jaw must correspond in size with those of the other, and if both are small the result is that the parts which should remain in contact during the grinding bite are carried beyond and away from each other, so ceasing to occlude, or doing so at only small portions of their surfaces. Any dentist who has set up both small and large teeth by the Bonwill system knows from experience that it is much easier to get scientific occlusion with the large ones.

And further: the small molar usually will not reach sufficiently far back to admit of that curve in the line of occlusion which when given to artificial dentures adds so much to their usefulness by preventing a dislodgment of the plates at their posterior borders when the mandible is slightly protruded and the incisors are brought in contact tip to tip. The degree of this curve is governed by the amount of overbite, and when this latter is at all large there is needed more stretch of line of molar occluding surface to properly give this curve than two short molars allow. The manufacturer not only throws out one molar altogether, giving us fourteen teeth to a set, instead of the sixteen of nature, but he also makes the two remaining molars much shorter than the natural ones. Unless, therefore, the dental mechanic adds a third molar of the smaller kind, he ought at least to give to the two he retains a sufficient backward reach to produce properly this desirable simulta-

neous occlusion of incisors and last molars. If the attempt be made to produce this curve with two small molars, the curve must in consequence be made quite acute (unless the overbite be very little), and this abruptness tends to displace the upper plate in biting by forcing it forward, just as does a tilted inferior *dens sap.* when an artificial upper molar has been made to occlude with its inclined grinding surface.

The small molar has forced itself into bridge work. Here it frequently appears looking almost comically diminutive alongside some great gold-clad natural molar. The reasons given for its employment are (1) that breakages occur less frequently with it than with the larger tooth, and (2) that it does not so much task the roots of the abutment teeth, the bite being lighter.

As for this latter reason, it appears to be the same fallacy as that which we touched on before, and may be answered in the same way—that a small tooth will convey pressure equally with a large one. The former reason—that of breakage—is more serious, but may be answered broadly that the bridge ought to be made stronger, not scrimped in size. The argument that a large tooth is more subject to strain because its greater breadth gives more leverage force to a bite falling on its extremities, buccal or lingual, is true only of bar bridges, whose supports are at the median line of the occluding surface; it is not true of bridges supported on gold crowns, where the entire crown forms the support. Such argument would have force only if the dummy crown were wider than that of the abutment. However, it is probable that the failures of large teeth in bridges are not so much due to the size of the tooth *per se* as to the fact that a large tooth, if not articulated *à la* Bonwill, is generally more apt than a small one to occlude wrong in lateral bites, because of its cusps rising higher; so that the whole weight of the lateral bite falls on an over-high cusp instead of being distributed over several teeth. This mal-occlusion can and should be avoided.

THE THIRD ARGUMENT.

It remains only to consider the third and last objection to large molars—that they interfere with the tongue by encroaching on its room, especially in the lower plate, thus tending to displacement of the plate by the tongue.

Now, if the tongue lay below the level of these lower molars it would be apt to occasionally raise the plate; but the tongue—at least the edge of it which comes in contact with the lingual surfaces of lower molars—rests about on a level with these molars, and therefore if it at all affects the plate's stability it is as likely as not to affect it beneficially by holding it down. Besides, as usually made, the lower molars of plates do not approach the tongue as nearly as do the natural ones. Absorption of alveolus affects this. A glance at an inferior maxillary bone tells us that the posterior alveolar process and its teeth are placed, not at the center of the bone, but entirely on one side—the inner—even leaning over in that direction. When absorption of the process has occurred, the dentist is naturally led to place his teeth over the bone and not in the position vacated by the process, and so he places them farther apart than is natural and gives to the tongue more room than it really needs.

Whether these artificial molars *ought* to be thus placed wider apart than were those of nature is another question, aside from the present subject. This much, however, may be said upon it: As alveolar absorption occurs in the upper jaw on the buccal surface and in the lower on the lingual surface, it results that an effort on the part of the prosthetist to gain stability for his plate by closely following the ridge in positioning his teeth will cause his two dentures to cross each other at the second bicuspid or first molar; which arrangement has this objection, that it shifts the burden of mastication in each case from that side of the molar which is nearer the ridge and throws it on the other side—on the buccal cusps in the upper plate and on the lingual cusps in the lower—with the ob-

vious result that stability is not conserved.

CONCLUSION.

To sum up the claims for the large molar: (1) It permits restoration of contour while preserving stability of plate in biting, better than does the small molar. (2) Its wider grasp of food in eating is of more value to man, because of his being largely a vegetable eater, than is the superior incisive action of the small molar. (3) It better admits of scientific articulation.

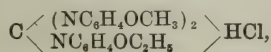
There are, perhaps, little less than five million dental plates, not to mention bridges, in these United States, many of which are worn by the aged and infirm, whose weakened powers of digestion need all the aid that art can render, and it is no trifling matter if we, the dental profession, are depriving these needy ones of some of the aid they might derive from us if by a greater fidelity on our part to the teachings of nature we furnished them with larger bicuspid and molars.

"ACOIN" AS A LOCAL ANESTHETIC.

By R. W. SIMON, D.D.S., Baltimore, Md.

(Read at the annual union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, May 21, 1903.)

I DESIRE to bring before you today my experience with a new preparation, introduced under the name of "acoin," and highly recommended in German medical and dental journals as a local anesthetic. Acoin is one of the many synthetic compounds which have been discovered of late, and which have contributed so largely to our *materia medica*. The composition of this preparation is represented by the formula



and is designated as di-paranisyl-monoparaphenetyl-guanidine hydrochlorid. More simply expressed, it is the chlorid of an organic basic substance resembling to some extent the vegetable alkaloids.

Acoin is a white amorphous powder, readily soluble in alcohol; it dissolves in pure cold water to the extent of six per cent. This solution has neutral reaction, a bitter taste, and possesses strong antiseptic properties. When kept in the dark the solution suffers no change for many weeks and is not decomposed by boiling. As alkalies precipitate the base, the solution, when kept in bottles made of im-

pure glass, turns opalescent or turbid in consequence of traces of alkali from the glass entering into solution and causing precipitation.

Regarding the physiological action of acoin I have to say that, while numerous excellent reports have been made on its effect as a local anesthetic, I have succeeded in finding but a few data referring to its general systemic action. However, I should mention the experiments made on animals, chiefly dogs and rabbits, by Dr. Trolldeneir at the Pathological Institute of Dresden, an account of which was published in the *Therapeutische Monatshefte* for January 1899. These experiments seem to demonstrate that while the action of acoin, when administered either internally or subcutaneously, is somewhat similar to that of cocain, it differs from it in so far as acoin is decidedly less poisonous and at the same time has a more powerful local anesthetic action. A concentrated (six per cent.) solution has strong caustic properties, and should not be used internally or hypodermically. Many reports on acoin by German, French, and English surgeons and oculists are found

in the various journals. Especially the latter specialists speak in the highest terms of their experience with the substance.

TESTIMONIES OF EUROPEAN DENTISTS.

Of most interest, however, to us is its dental application, and strange to say, while I have found no report in our American journals, some European dentists have used acoin for at least two years.

Dr. H. Nipperdey, dentist in Gera, Germany, read a paper before a dental association which was published in the November 1902 issue of the *Deutsche Monatsschrift für Zahnheilkunde*. The author reports that he has used most successfully an aqueous solution containing 2 per cent. of acoin and 0.08 per cent. of sodium chlorid. In no case did he notice any dangerous or even unpleasant symptoms, and he thus concludes the article: "As far as I am now able to judge, acoin as a dental anesthetic leaves scarcely anything further to be desired; it is one that even in acute periodontitis acts faultlessly."

Dr. Bab of Berlin has published an article in the *Wiener Zahnärztlichen Monatsschrift*, embodying the results he obtained with acoin. The solution which gave him most satisfaction has the composition: Acoin 0.5 gm., cocain mur. 0.5 gm., sodium chlorid 0.8 gm., carbolic acid 0.2 gm., aqua dest. ad 100 cc. He considers this solution, containing only one-half of 1 per cent. each of acoin and cocain, equal in its anesthetic virtue to a 5 per cent. cocain solution. Dr. Bab has used acoin in over 200 cases and emphasizes the fact that he has never noticed such symptoms as giddiness, vomiting, fainting, labored respiration, etc., as may be expected to occur in cases where even 0.03 gm. of cocain are injected; neither in the cases of patients with cardiac affection were unpleasant symptoms noticed; nor did he observe a case of idiosyncrasy. He explains the harmless action of the solution by the fact that with the injection of each cc. only 0.005 gm. of each, acoin and cocain, enter the system—quantities which are too small

to do harm, especially as acoin is only one-third as poisonous as cocain.

Dr. Spindler of Russia says, "Its advantages over cocain are: Its anesthetic action lasts three or four times as long and covers a larger area. Subsequent pain, which, especially with eucain, is often very troublesome, is entirely absent."

Dr. Trolldeneir gives a very interesting table of acoin's anesthetic period in solutions of different strengths, viz:

Acoin solution—

1:1000	anesthesia lasts	15 minutes.
1:400	"	30 "
1:200	"	60 "
1:100	"	40-80 "
1:40	"	over one day.

THE WRITER'S OWN EXPERIENCE WITH ACOIN.

My personal experience with acoin has been as follows:

At first I used the solution recommended by the previously quoted German dentists, and having the composition—Acoin 3.9 gm., cocain mur. 3.9 gm., sodium chlorid 6.2 gm., carbolic acid 1.5 gm., glycerin m iij , water ʒij .

The anesthetic effect of this solution was perfect, but I noticed a little sloughing, such as often follows the use of cocain. This fact, and also the idea of testing the anesthetic properties of acoin by itself, caused me to omit cocain and the solution which I have since used exclusively has the following composition: Acoin gr. viij; morphin sulfate gr. ss; sodium chlorid gr. xij; carbolic acid gr. iij; glycerin m iij ; distilled water ad ʒiv . This solution I have used now in about one hundred and twenty-five cases with marked success. The anesthetic effect in all ordinary cases is perfect, and in no instance have I noticed sloughing; neither have I noticed any depressant effect on the heart's action, nor any other sign of systemic effect. Of special cases of interest I will mention these:

(1) Patient was a middle-aged lady of nervous temperament and weak heart, her own physician having advised her to be very careful. Eighteen badly decayed roots had to be extracted. I injected ʒss of the solution. I proceeded to extract

very rapidly, when the patient grasped my hand, and said, "Doctor, please take your time, as I do not feel any pain at all, so don't hurry unnecessarily." The patient, being a nurse, wanted a temporary set at once; so I took an impression about half an hour after extracting, and that you may see how little swelling had taken place, I present the model for your examination. The gums healed up splendidly; no sloughing occurred, and the usual after-pain was absent.

(2) In order to compare the value of cocain and acoin I used on a patient whose two upper first molars had to be extracted, on one side cocain, on the other acoin. Where cocain was employed some sloughing occurred, while acoin produced none at all.

(3) A young lady presented herself for the extraction of the lower second molar. Notwithstanding that the acoin injection had been made, the operation was decidedly painful. This was due to the fact that the second and third molars were ankylosed, and the extraction had to be accomplished by means of an elevator. This has been the only case in my

practice in which pain was complained of. In cases of the extraction of teeth with an abscess the injection at times was painful, while the extraction itself was painless or nearly so. In case of cocain, as well known, there is generally, first, a burning, stinging pain, and considerable pain during the extraction of abscessed teeth. The quantity of solution used depends on the prevailing conditions, but I may say that $\text{m} \times \text{lv}$ for one tooth is sufficient and about 3ij for full upper extractions.

The removal of an exposed pulp I have effected by first placing a little acoin in powder form in the cavity and moistening with water or alcohol; after waiting one or two minutes the pulp may be removed. In several cases of sensitive dentin I have used the powder in the same manner with excellent results, except in one case, where neither acoin nor cocain seemed to have any effect whatever.

In conclusion I will say that my experience with acoin leads me to believe that it is a most desirable addition to the list of our local anesthetics.

A CROWN FOR SPLINTERED ROOTS.

By F. W. HARDEN, D.D.S., San Francisco.

TO successfully crown a splintered root has always been a difficult matter, because of the inability to gain perfect contact between the broken surface and the crown. Especially where anterior roots are fractured by unbanded post crowns (see Fig. 1), the splinter is apt to extend so far under the gum that to expose the broken surface sufficiently to get any satisfactory impression of it proves impossible. A method of restoring such roots is here offered.

Dissect the splinter from the gum, carefully avoiding injury to the peridental membrane of the remaining portion

of the root. With any one of the small swaging devices for backing facings, swage a piece of pure gold or platinum plate, No. 32 gauge, to fit the broken surface of the splinter. This can be safely done without the least danger of breaking the thin edges. Very carefully trim the surplus by filing *toward* the splinter. If this work has been done nicely there is now a plate of metal which exactly fits the face of the root. (Fig. 2.) Lay this piece face downward on a little investing material, and contour with high grade solder, to as near the bulk of the splinter as possible. (Fig. 3.)

The root should be left as long as possible lingually, and be made distinctly cone-shaped, so that in the finished crown the encircling band, in sliding to place, will hold the gold splinter closely in contact with the root.

Place the gold splinter in position and have it held firmly to its place against the root. Fit a band around the root and the splinter, being careful to have

touring the metal splinter. Solder a small iridio-platinum wire along the center of the metal splinter with platinum solder (Fig. 6), and have this answer the double purpose of stiffening the splinter and providing an attachment for the porcelain root-contour.

The root-contour and the lingual contour can be baked at the same baking. (Fig. 7, A and B.) An oval iridio-plati-

FIG. 1.

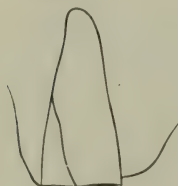


FIG. 2.



FIG. 3.



FIG. 4.



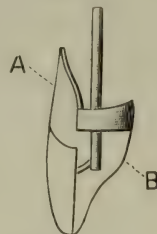
FIG. 5.



FIG. 6.



FIG. 7.



it follow the slant of the root lingually. Solder the band to the splinter by waxing together with sticky-wax, removing and investing. (Fig. 4.) Return gold splinter and band to position, cutting off surplus from band and beveling front. Solder on top and post as in any other crown (Fig. 5), and finish by grinding and soldering porcelain facing to place.

If a baked porcelain crown be desired, proceed in the same way, using platinum instead of gold up to the point of con-

num post, extra long, is necessary with this crown. The necessary dryness to insure successful setting can be secured by the use of adrenalin chlorid to control bleeding, and trichloroacetic acid to prevent weeping of the gum tissue.

The principal advantage of the swaged splinter is its perfect adaptation to the splintered root surface, whether that surface be visible or not, thus giving a minimum amount of cement in the joint and no possible shoulder of gold to irritate the gum tissue.

A CASE OF LINGUA NIGRA WITH ASSOCIATED GINGIVITIS.

By S. S. MCFARLANE, D.M.D., Frankfort-on-Main

(Read before the Section on Odontology and Stomatology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

CASES of "black tongue" and of "hair tongue" have been recorded in dental literature from time to time. Amatus Lusitanus reported a case of hair tongue in 1557, and Brasin and Sendziak have given fuller descriptions of such cases in 1888 and 1894.

Yellow and brown spots on the tongue are mentioned by Dinkler, and Maurek reports a case of green tongue.

These affections are caused by a fungus, probably taken into the mouth with food or drink. The characteristic fungus which is present in black tongue has been named *glossophyton* by Dessais, and is attributed to the "Mucor" species. Ciaglinski and Hewelke also found a distinct fungus-like organism in cases reported by them in 1893.

There has been quite a difference of opinion as to the manner in which the coloring matter is produced. Ciaglinski, Sendziak, and Schmiegelaw all claim to have found a fungus whose spores showed an intense black color. Maurek found a diffused coloring of the horny epithelial enlargement of the papillæ filiformes, but found no characteristic fungus.

The case to which I wish to call your attention occurred in the mouth of a patient who had been traveling in Roumania. The first symptoms noticed were intense irritation in the gums, accompanied with swelling of the gums and also with rather marked constitutional disturbances, such as fever, irritation of the skin, and deranged digestion. When the patient consulted a medical practitioner the latter was much astonished to find the tongue a very dark

brown, and asked if he had been drinking ink.

When the case came into my hands, these conditions had existed for about six weeks. The filiform papillæ were enlarged and of a dark brown color. The spot of color was irregular in shape with a wide base, narrowing almost to a point near the tip of the tongue. The filiform papillæ were lengthened to such an extent that the surface of the tongue presented the appearance of being covered with a brown fibrous mass.

The tongue was not irritated and was not painful, the patient complaining only of a loss of appetite and distaste for food. The gums, however, were very much inflamed and had sloughed in a number of places, destroying the septa of gum between the teeth. Pockets had been formed which filled up with food, and the gums were so sensitive that mastication was almost an impossibility. I succeeded in relieving the acute symptoms by washing the pockets thoroughly with a three per cent. solution of pyrozone, packing them with orthoform and prescribing the use of listerine as an antiseptic mouth-wash—depending largely on the action of the boro-benzoic acid contained in it. I then endeavored to remove the fungus from the tongue. This was accomplished by scraping with a thin-bladed spatula, and in this way large quantities of the fungus were removed at several sittings. In continuing the treatment, before packing the pockets with orthoform I applied in the pockets what is known as the 1-2-3 mixture of oil of cinnamon, carbolic acid, and oil of

gaultheria, to act as a germicide and also to stimulate the gums to form healthy granulations.

The gums improved rapidly and the tongue was almost free from the fungus growth in ten days. The patient being obliged to go on a journey, I did not see the case again for two or three weeks, but recommended the treatment to be carried out as directed. When I next saw the mouth the gums were again much irritated, as the patient had not been able to keep the pockets free from food. The same treatment was pursued with interruptions, and when I last saw the case the improvement was so marked that a complete cure is to be expected in a short time.

With the aid of a colleague who has had large experience in bacteriological work, I made cultures from scrapings taken from the gums. We were successful in obtaining a characteristic fungus in both cases, that obtained from the gums being identical with that obtained from the tongue.

This is the first case of which I have heard in which the fungus has been found in the gums, and the irritation and loss of tissue are accounted for by the presence of an active pathogenic or-

ganism in this case. Scrapings taken from the tongue, when placed under the microscope, show the coloring matter evenly diffused through the substance of the filiform papillæ, as mentioned by Maurek.

That cases of lingua nigra are extremely rare may be judged from the fact that Professor Mikulicz of Breslau, who has written a work on diseases of the mouth, has personally seen but three cases during many years of extensive surgical practice and hospital work. Professor Miller, in his work on "Micro-organisms of the Human Mouth," speaks of having heard of but one case, and I was therefore anxious to present a description of this case to my colleagues.

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COMPARATIVE NOTES ON THE ADMINISTRATION OF SOMNOFORM.

By FIELD ROBINSON, D.D.S., Bordeaux, France.

(Read before the Section on Odontology and Stomatology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

SOMNOFORM is a mixture of 60 per cent. ethyl chlorid, 35 per cent. methyl chlorid, and 5 per cent. ethyl bromid. It is extremely volatile and of not unpleasant odor. Its origin is due to the necessity Dr. Rolland found for a rapid anesthetic which would not be inclosed in the cumbersome, un-

sightly, and terrifying cylinders and apparatus employed in nitrous oxid narcosis, and also which from its physiological action would not produce that asphyxiated appearance which gradually steals over the countenance of those who take nitrous oxid, starting from a lightish blue color until in most cases the tone

becomes almost black, and which is so alarming to those relatives or friends who from sympathetic motives insist on being near the patient.

The superior qualities of somnoform over nitrous oxid as an anesthetic were discovered by a series of complete narcoses caused by the local application in a jet upon the gum, of a mixture of ethyl chlorid and methyl chlorid for the purpose of producing intense cold to permit an extraction to be done with the minimum of pain. These narcoses were first taken by Dr. Rolland for syncope, and he was inclined to cease his experiments, when on further and properly speaking scientific investigation and examination the true nature of this short anesthetic effect was discovered. He then resorted to the mixture, in different proportions, of the component parts of the above-mentioned drugs; the small and minimum proportion of ethyl bromid being present in order to produce the analgesic condition which comes between complete anesthesia and complete but too instantaneous return to consciousness; and it cannot in any way, except by the most biased mind, be considered other than an advantageous addition to the two chlorids.

Dr. Rolland's first presentation of somnoform to the scientific world was at the Congress of the French Society for the Advancement of Science held at Ajaccio in September 1901. Since then he has read papers and given the results of his further researches before the Medical and Surgical societies of Lôt et Garonne and of Bordeaux. I myself read at the last annual meeting of the British Dental Association, held at Shrewsbury, Eng., in May 1902, a paper on "Somnoform," in which in conjunction with Dr. Rolland I gave an elementary scientific *résumé* of physiological phenomena, with tracings taken of the radial artery both before and during anesthesia by somnoform, by the sphygmograph and the sphygmomanometer, and from a clinical point of view also the subjective and objective phenomena, with finally the indications for its use. I will not here enter into any details, as time presses and you will find my paper

published *in extenso* in the June 1902 issue of the *Journal of the British Dental Association*, vol. xxiii, p. 321.

Since then Dr. Rolland brought forward at the meeting of the French Dental Association held at Montaubon, August 1902, a series of most interesting experiments on animals, and also the effects produced by chloroform, ether, and somnoform as far as particular hematological modifications are concerned during their respective narcoses. This work was done in conjunction with Professor Sabrazes of the Bordeaux Medical Faculty, and was duly published in *Odontologie*.

I think I can say that since that period Dr. Rolland has not ceased his scientific work upon the difficult and many unexplained actions of anesthetics upon the minute unities which collectively make our organism; and I would refer you to the section of this Congress where he and Professor Cavalié are giving the results of their researches on the functions and variations of the pyramidal cells of the brain cuticle when the blood-cells are charged and intoxicated by an anesthetic, asking you to allow me to proceed at once to the practical part of my paper.

The original apparatus, if it can so be called, which Dr. Rolland and myself demonstrated at the Shrewsbury meeting of the British Dental Association, was an ordinary linen handkerchief, in the folds of which is placed a piece of paper, the whole refolded to form a cornet and fixed with a trouser-clip or a safety-pin; a piece of absorbent cotton is put in the extreme pointed end so as to hermetically seal the same. A bottle of somnoform with its distributor on is suspended from the buttonhole of the coat by a piece of tape or string, and 5 cc. of the liquid squirted on to the absorbent cotton and the surrounding parts of the handkerchief, which is then placed on the face in such a manner as to positively exclude any infiltration of air. Our clinic was given on the Saturday morning, the last day of the meeting, in the dental department of the Shrewsbury Infirmary, and as it was the only clinic that day we were

honored by a full and almost complete gathering of those members of the association present at the meeting.

Prior to beginning with the patients that I operated upon, I asked that a record of the respective times occupied in the induction and duration of anesthesia should be taken by the different members present, stating that the results of their observations would be our official record of the same. The following were the results on seven patients who had traveled from Liverpool, and who, although tired and under disadvantageous conditions, were put under somnoform without any one of them showing any state of excitement or fear during or after the operation:

	Induction.	Duration.
1st patient	.....45 seconds.	65 seconds.
2d "	.....18 "	30 "
3d "	.....32 "	53 "
4th "	.....31 "	45 "
5th "	.....30 "	60 "
6th "	.....40 "	60 "
7th "	.....45 "	80 "

Quantity of somnoform employed, 5 cc.

This gives an average of thirty-four seconds for induction on the seven patients operated upon, with an average duration of fifty-six seconds, and must be considered our official record for anesthesia by 5 cc. of somnoform when employing a simple handkerchief cornet.

On Dr. Rolland's return to Bordeaux from the congresses at Rome and St. Gall, he informed me that at the latter meeting several Swiss dentists were employing masks, and as the extreme simplicity of folding a handkerchief to form a cornet seemed—paradoxical as it may appear—its difficulty, we decided to try masks. We were not pleased with any, and did not find any advantages from their use, until we tried the one proposed and designed by Dr. de Crésantigne, which is a modification of the handkerchief cornet, with a bladder fixed to the end of a metal cone, as you will see by the one I hand around. This arrangement, while insuring the closest and most hermetic application to the face, gives a supplementary amount of air which, im-

prisoned in the bladder, becomes more and more charged with somnoform as the patient breathes, thus assisting the instantaneous effect of the anesthetic without diluting it. The results obtained were surer and better than with the handkerchief when the latter was in inexperienced hands, and the sensation of lack of air was abolished.

My observations on a certain number of cases have given the following averages:

Average induction, 30 seconds.
 " duration, 58 "

My objections to this mask are that the constant use of the same handkerchief, and the same sponge and bladder, does not offer a desirable antiseptic condition, which should always be an important consideration, and that it once more necessitates the folding of the handkerchief to make the cone, while practically having no advantage over the simple cornet originally mentioned other than that of the bladder, which does away with "air hunger," as Dr. de Crésantigne calls the slight stifling sensation felt after the first inhalation from the simple cornet. Dr. Pinet, professor of anesthesia in the Paris Dental School, and Dr. Charles Jeay, his chief demonstrator, published a series of their experiences with this mask in Ash & Son's *Quarterly Circular* for June 1902, p. 148, using somnoform as the anesthetic.

During some few clinics Dr. Rolland decided to experiment with a simple compress made of an ordinary handkerchief unfolded, on which he sprayed his anesthetic; this compress was not held tightly upon the face, but was simply applied in such a manner that air could pass as well as the vapors of somnoform. The results, as you will see, were not favorable, and this system has been abandoned:

Average induction, 1 min. 25 seconds.
 " duration, 40 "
 " quantity employed, 8 cc.

In each case knowledge of what was going on was charged, although without real pain being felt.

To be able to realize at the same time and with the same objects the advantages to be obtained from a mask which could be thoroughly cleansed and sterilized while giving all the advantages of the supplementary air-bag, Dr. Rolland and myself have produced what we consider the ideal mask for anesthesia by somnoform or any of the ethyls which one might prefer to use singly. This mask is made entirely of glass, having on one side a metal box which opens by a spring being touched; the lid then flies back, and exposes two metal bars which are placed there to facilitate the breakage of the small glass capsules I will show you presently, and which contain exact doses of somnoform. The hermetic adaptation of the mask on the face is obtained and assured by a pneumatic rubber band, of which there are two sizes, one for adults and a smaller one for children. At the other end of the mask is fitted either a rubber bag, or better still a sterilized bladder, which can be easily changed and either one or the other would be the air reservoir. A wire running through the mask and fastened by a screw at the end, which is the place where the rubber bag or the sterilized bladder would be attached, keeps a lint diaphragm fixed inside the mask on which the anesthetic can be sprayed, if the bottle be used. The lint also prevents the ends of the broken capsules from coming forward into the mouth, as well as absorbing any liquid coming from the broken capsules. Furthermore, when somnoform is sprayed into the mask through this metal box and immediately behind the diaphragm, this latter again absorbs any excess of liquid prior to its evaporation.

The manipulation is as easy and simple as could be wished, and the following observations on nearly five hundred patients, both in my own *clientèle* and on those who come to Dr. Rolland's Thursday morning clinic, have given this positive fact—all observations having been timed by a stop-watch and duly controlled by medical men assisting at these clinics or by demonstrators or independent and impartial spectators:

With an average dose of 3 cc. the results are as follows:

Average dose, 3 cc.
" induction, 30 seconds.
" duration, 78 "

Independently of the possibility of controlling the fact of the patient breathing or not by the inflation and contraction of the bag or bladder, and the almost certainty of success in the production of anesthesia even when this mask is in the hands of one inexperienced in its use, there are the following special advantages which are not to be found in any other mask with which I am acquainted.

One is able to see, through the mask, the gag and also the mouth, so that should anything inopportune occur, such as the displacement of the gag, the operator can signal the same at once and the state of things be remedied, and the anesthesia can be continued and completed immediately. Any modification of the color of the mucous membrane can also be noticed.

Thus, gentlemen, you see that by this new process of administration we are able to assure the proper automatic adaptation, so to speak, of the pneumatic tube upon the face.

Further, the exact measurement of the quantity of somnoform employed, having this put up in glass capsules of 3 and 5 cc. respectively; the certainty of the homogeneous composition of the anesthetic employed; the possibility of obtaining the maximum dose of somnoform from the hermetic inclosure of the drug in the space between the face and the fully developed volume of the air-bag, thus having no loss from absorption as by the handkerchief cornet; with the minimum risk—aye, one might say, the total absence of risk, inasmuch as we are now in our 15,000th series of administrations of somnoform—when a mask is used in conjunction with 2 to 3 cc. of the drug.

Further, the practical renewal and complete antisepsis of the apparatus used by immersing the rubber face-tube and the whole of the glass mask and metal

wire in a 1:1000 solution of mercury cyanid. After having destroyed the bladder by fire, a new one can be put on at the minimum expense of eight cents, or fourpence, thus allowing any dentist to change the air-bag for every patient—a thing which ought to be done as a bounden duty when even the slightest doubt can exist about the perfect freedom from tubercular affections of the patient actually in the chair. These incontestable advantages of the combination of a glass mask with mathematical doses of somnoform put up in glass capsules which are sealed by soldering the end of the tube; the maintenance of the minimum time of induction; and the almost doubling of the duration of complete anesthesia—facts confirmed by a large number of practical administrations, added to the easy and inexpensive absolute antiseptic cleansing of the mask, constitute the practical progress of our efforts, and I submit them to you with feelings of confidence in your approval, but also with an appeal to that inventive genius with which most of you are individually blessed, to favor us with any ideas of improvement on this technique which might occur to your mind as advantageous.

From a theoretical point of view, I have no time at my disposition to enter into any of the questions which were presented by us last year other than to say that Dr. Rolland and Professor Cavalié are reading at this Congress the results of their researches, and, I would ask you to be present at their lecture. This I can truly say: No other anesthetic used offers the same degree of security, when both are used with equal care, as this does. No stays are ever loosened, no collar-stud taken out, no shirt-band undone, no questions are asked at the clinic. People just come in and sit down as they are and are put under the influence of somnoform; they get up unaided, as you will see at our demonstrations, and walk away without having the staggering gait

and ugly appearance of those who have taken nitrous oxid; and it is rare, very rare, although such a condition does sometimes exist, that we find nausea after the operation. Its security seems to be a record security from the fact that Dr. Rolland's clinic record is now between 15,000 and 16,000 cases, and he has not yet had one accident, or any case that has caused him real anxiety. Our profession, as well as the medical profession, owe to this medical man, who in his position of professor of anesthesia in the Bordeaux Dental School has discovered and had the courage to practically apply and study scientifically this previous lacuna, viz, an anesthetic which can suppress all agony during short but excruciatingly painful operations by the surgeon, the dentist, the oculist, or the laryngologist. It is a pleasant duty for me to recognize this publicly, and in our professional name to thank him for his discovery, as I also thank you, gentlemen, for your patient hearing.

Résumé.—Thus whereas with a simple handkerchief cornet it took, with 5 cc. of somnoform, an average time of 34 seconds for induction and procured a duration of anesthesia of 56 seconds; now, with $2\frac{1}{2}$ or 3 cc., or half the former quantity, used in a mask having an air-bag attached to it, the induction is on an average shortened by 4 seconds, and the duration of the anesthesia increased by 22 seconds.

Furthermore, when a glass mask is employed and the air-bag is composed of a properly sterilized bladder, the former can be submitted to antiseptic purification, and, the bladder being changed, a practically speaking new mask is made, at the minimum cost and with the maximum guarantee for its freedom from possibilities of infection.

Lastly, with the anesthetic hermetically sealed and soldered in glass capsules, its absolute homogeneity is assured, and the quantity given in doses mathematically controlled.

CORRESPONDENCE.

THE BACTERIAL PLAQUES.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Replying to Dr. Williams' interpellation in the October number of this journal, I must first beg his pardon, and that of others who may be in the same position, for a slight oversight.

The close of the first paragraph should read: "In the May 1902 and the January and February 1903 issues of the DENTAL COSMOS."

I had already noticed that the refer-

ence to the May 1902 issue had been omitted, but did not deem it necessary to correct the mistake, supposing that the readers of the Cosmos would have seen the article referred to, in which twenty pages are devoted to a discussion of the question of bacterial plaques on the surface of the teeth.

Yours truly,

W. D. MILLER.

BERLIN.

PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, October 1903.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, October 20, 1903, at the Academy of Medicine, No. 17 West Forty-third street, New York city, with the president, Dr. Hodson, occupying the chair.

Dr. B. C. NASH. During the summer I received a notice from Dr. J. A. Libbey, who is chairman of one of the committees of the St. Louis Exposition for 1904, appointing me chairman of the State Committee for this state. The appoint-

ment was rather vague as to the duty of the chairman of that committee, and, while I accepted it, I was unable to act until I received further information. Today I received a letter from Dr. Libbey, which evidently indicates that the State Committee for New York state shall act as a committee for collecting funds and securing members for the St. Louis Exposition, those members to obtain their membership on the payment of ten dollars. Receipts will be forwarded to me, numbered, and after having se-

cured members I am expected to report to Dr. Charles S. Butler of Buffalo, who is chairman of the Finance Committee, and certificates of membership will be issued by him to those who have paid the fee. In addition to this it is expected that the committee will, if possible, secure financial help from the district societies—that is, the societies will be desired to vote an amount for the furtherance of the Exposition. The whole thing is scarcely in shape for me to follow out any plan as yet, but I thought it would be a good opportunity to bring this up, because the societies will be expected to furnish the backbone for the success of the Exposition. It is not intended that membership should be confined to society members, but that all who become members will be ethical professional dentists.

The PRESIDENT. In that case, the secretary will leave the whole matter over until the next meeting.

Dr. W. J. TURNER. I have received a communication from the secretary of the Second District Dental Society, inviting this society to be its guests at its January meeting. It will be held at "The Assembly" in Brooklyn, on the second Monday in January.

On motion, the invitation was accepted and the secretary requested to convey the thanks of the society to the Second District Society.

INCIDENTS OF OFFICE PRACTICE.

The PRESIDENT. I have often urged upon you the propriety of thinking each month of one little incident of office practice to bring to our meeting. If we would do that, and conscientiously remember that this society has its claim upon each individual member that he should bring his quota, instead of coming to listen to every other man's contribution, what full meetings we would have, and how very interesting!

The incidents of office practice are really the practical application of our work. The papers supply food for our thought and speculation—they are specu-

lative very largely; but the incidents of office practice are the outcome of the stumps we run against, and the ingenuity with which we get over and around them. What a small matter it is to think of one little incident to bring to the next ensuing meeting. I wish you would take it into your minds and hearts to do that, instead of coming to listen to other men.

Dr. TRACY. I might mention a case that would be interesting to some of the gentlemen. A patient presented with a troublesome lower right first molar. He had never been to me before, but he came with his brother and requested an examination. He lived in Pennsylvania, and was going home that same day. The lower molar had a chronic abscess on the posterior root, and for a number of weeks had been unsuccessfully treated. The tract of the fistula passed from the buccal aspect of the gum right through to the lingual, and a small curved silver broach could be passed through. I did not get the history of the case very clearly, except that it had been treated several times. The fistula was discharging pus on both sides. I examined it carefully, and in passing a Donaldson broach down the posterior root-canal, the first time I withdrew it I pulled out the whole of a hypodermic needle. The canal had evidently been opened with a Gates-Glidden drill, and the needle had been passed down with the intention of forcing some medicament through the root, and had broken off. The patient had never been informed of it. I was a little puzzled at first, but soon saw what it was. Since then I have seen the patient's brother, who said the treatment was continued for a time, but that the tooth was finally sacrificed. I dare say the dentist tried his very best to get that needle out, and I, who did not even know it was there, got it out accidentally the first time I explored the canal. I suppose it had been loosened by corrosion.

Dr. WM. JARVIE. How long a piece was it?

Dr. TRACY. Almost half an inch long—not quite that, perhaps, but at least three-eighths of an inch.

Dr. JARVIE. I have rather an interesting case, although it may not be the least bit instructive. The football season is on, as you know, and a few days before I returned from my summer vacation, a young patient of mine, about thirteen years of age, emulating the juniors and seniors of the larger universities was playing football, and got hit in the mouth. He said nothing about it at home, but his teeth became sore, and in a couple of days he had a badly swollen face. The lip and point of the nose were about on a line, and the cheek and nose also. When I came home he was brought into the city and I saw him. The upper central and lateral were so loose that in working a broach wrapped with cotton up and down in the pulp-canal it was necessary to hold them in place with my finger and thumb, or I should have drawn them out. The central incisor—I am not exaggerating—was one-quarter of an inch down from its socket. A great deal of pus was exuding around the neck of the tooth on the labial aspect, and a probe distinctly indicated that the alveolus had been broken and separated quite a little distance from its proper position. Some two weeks after treatment, the discharge of pus still continued, although the swelling had almost entirely subsided, and the color of the gum indicated necrosis. After deciding that that was the case, I took the boy to my former associate, Dr. Parker, who for some little time has been doing a great deal of oral surgery—and doing it very nicely, too. He anesthetized the parts with eucain and burred out a place as large as the end of my finger. He found the bone was softened, rather than hard as it is in ordinary necrosis. It was of a cheese-like consistence and the bur made no sound. The detached piece of alveolus was about as large as a five-cent silver piece. Since the operation three or four other pieces of bone have come away from the transverse processes. Evidently the blow had been of sufficient force to shatter the bone into several pieces. The boy is still under treatment, and getting along nicely. The case is interesting, even if not specially instructive.

The PRESIDENT. Does Dr. Jarvie suggest that he is pretty sure of saving the teeth as they stand?

Dr. JARVIE. Yes; I think there is no doubt that I shall save the teeth. The tests applied to the lateral incisor indicate that the pulp is alive, but the pulp in the central must have been devitalized with the blow. No pus came through the pulp-canal of the central incisor, but a good deal from the socket.

The PRESIDENT. Was there much necrosed bone removed from the territory of the end of the lateral, so that you would question the present integrity of the pulp?

Dr. JARVIE. The end of the lateral is not entirely exposed; the end of the central is.

Dr. J. B. LITTIG. Do you expect a reproduction of the alveolus?

Dr. JARVIE. Yes; I have seen quite a number of such cases. I had one case, if you will allow me to tell of it, where the conditions were somewhat similar, although the boy was older—about seventeen. There was necrosis around the upper lateral to such an extent that after the necrosed bone was removed I could have put my thumb up to the knuckle in the pocket. The roots of the lateral and of the central were standing perfectly independent of any sort of tissue but the gum. There is a reproduction of bone in that case, which was operated upon two and one-half years ago. There is still, however, a depression of a quarter of an inch where the incision was made, but it is becoming less and less. In such cases the bone may be removed and the teeth saved, as long as the gum is intact around the necks of the teeth.

Dr. M. L. RHEIN. At this time of the year, when it grows dark so early in the day, one of the most important questions in our practice is that of light—how to get proper artificial light to work with, so as not to injure the eyes. This has been to me a very great problem in the past few years of my practice; all of the methods of illumination that have come under my observation have been more or less objectionable. The throwing of a

light directly into the cavity of a tooth or directly against the mouth of a patient, leaving the rest of the room in darkness, which is the method I believe most generally used, is a very disadvantageous method for the operator to pursue, and I think it is bound to be injurious. I have been experimenting with this question for a number of years, and last spring I placed in position in my operating room a method of lighting it with diffused light as strong as any light that we generally work with during daylight, and it has been so satisfactory to me during the short time I have had it that I feel it my duty to present it to you upon the first occasion that we meet together. I have made use of what is known as the Holophane globe for directing and concentrating the rays of light, using the electric light and suspending it over the operating chair in such a way that I can raise and lower it and move it horizontally. If I should attempt to describe the method adopted I am afraid I should not be able to picture it in such a way that you would understand it, and yet I feel that it has been of so much aid to me that I am impelled to bring it to your attention, with the invitation to every one of you to come to the office and look at it for himself. It would be almost too much work for me to take it down, now that I have it in position, and bring it here. I have spent considerable time and money in experimentation, until I have obtained this result. A couple of the gentlemen present—Dr. Tracy, and Dr. Gaylord of New Haven—have seen it, and if the society would like to set a time some evening, between five and six, I would be glad to have you come and look at it, because I feel it answers a long-felt want in our daily practice. I do not want you to think that I feel any personal pride in bringing this forward, but it has answered a purpose to me that I consider invaluable, and I want the other gentlemen to benefit by it too.

There is no name to the light, except that I have made use of the Holophane globe in a way that I devised myself, with the aid of a couple of men I employed for that purpose. The best way to under-

stand it is to come and look at it. Any gentleman could rig up something on the same principle after seeing it.

Dr. GAYLORD. I would like to add a word, and at the same time draw Dr. Rhein on a little further. He has placed us upon the anxious seat—those of us who have not seen it—but he neglects to tell of a strong feature, and that is, the absence of the shadow of your own hand or head in your light. With this light he eliminates that feature, which is a characteristic one of all other lights that I have seen. In addition, I would like to draw him out as to the probable cost of a duplicate of that light.

Dr. RHEIN. I did not want to take up the time of the society in discussing the merits of the light as it is arranged in my operating room. It has that admirable feature of casting no shadow. That is due to the globe which is used. What it would cost to duplicate, I do not know. I know it cost me a great deal more than a duplicate of it would cost anyone else.

Dr. JARVIE moved that Dr. Rhein's invitation to inspect the light at his house be accepted for Friday evening, October 25th, between five and six o'clock, with thanks. The motion was carried.

The PRESIDENT. I have brought with me tonight a little thing, but like many other tiny things in our practice, it is of real importance and value. The Johnson & Johnson Co. are making some very beautiful pellets for the drying of cavities. The only objection to them in my estimation is that they are made in rolls and are then clipped off similar to the way a farmer cuts his hay, in short pieces. That leaves square ends to them, which are difficult to get into a cavity and are more or less tiresome to use in that way. So I have my office boy take those same points and cut them diagonally, from corner to corner, which gives two sharp points. I will pass them around so you may see how they are cut. There are several gentlemen who have never seen my slip matrices, even though I have talked about them considerably and they have been illustrated in the

COSMOS several times. They are such a very great comfort to me every day of my life that men have been asking me to bring them here and show them again. I will not take up your time now, but after the meeting I will show the arrangement of these matrices.

Dr. Tracy read a letter from Dr. C. A. Marvin, thanking the society for its invitation to attend the meeting, and extending his good wishes.

The President stated that the society would be very glad to welcome Dr. Marvin whenever he should attend the meetings.

The PRESIDENT. As we have no essayist, the meeting will be devoted to a consideration of the different phases of porcelain work. Will Dr. Perry open the discussion?

Dr. S. G. PERRY. I think we might for a moment consider the subject of porcelains from a different standpoint than we are in the habit of doing. We might go back a little to advantage. The question has been so much discussed that there does not seem to be much interest in it, and yet there ought to be, because it is the beginning of a new era in dentistry.

Did we ever stop to think that porcelains have interested the human race as much as any other department in art, from the time of the early Egyptians, when bricks were made from clay strengthened with straw, and dried in the sun, before it ever entered the minds of men to bake them at all? The next step was that of baking the bricks, and from the making of utensils for use, by slow degrees came the making of utensils that were ornamental, and so on up to the present time, when some of the most beautiful works of art that were ever made by the hand of man have been done in porcelain. So when we consider the question of porcelain as applied to the human teeth, we are truly within the realm of art. However we may consider it, from the utilitarian standpoint or the ornamental, it is purely a work of art.

As much effort has been given to the ceramic art as to sculpture or painting, or any other department of art. The

records of pottery are perhaps more lasting than the records of any other department of art. They are indestructible, in fact, and one who has a deep feeling for art will find no more interesting subject than to follow the rise of the ceramic art.

The Chinese are supposed to have reached the highest development three or four hundred years ago in making strictly beautiful kinds of pottery—beautiful for their form as well as their color; in some respects those ceramics are today a lost art, because some of them cannot be duplicated. The secret of the pigments that gave the beautiful glazes has been lost.

When we come down to a later period there is an endless diversity and variety of forms. I had occasion this summer to go through a porcelain factory in Carlsbad. I never before had understood just how the ordinary porcelains of commerce were made, and it was one of the most interesting afternoons I ever passed. It was a revelation to me. I can understand why here and there you find a person who is infatuated with the subject. It is a beautiful world—this world of ceramics. I do not suppose we stop to think of the effort that was given to the simple production of porcelain teeth in the early days. I can remember the lectures, in my student days, of dear old Dr. Wildman on the subject of baking porcelain teeth. No member of the class seemed to grasp the beauty of it, and I don't think any of us followed it up.

For the last twenty-five years the art of baking and making porcelain teeth in our individual offices, in the city of New York at least, has been not exactly a lost art, because it never has been a found art. It has been said that in Boston teeth were carved and baked more than in New York, and I think the same has been said of Philadelphia. We have been dependent upon the supply given to us by the manufacturers. Now we are at the beginning of a new era, and the outlook is very hopeful. I think this has been brought about by the new interest in porcelain fillings.

This summer, in Dresden, I had the

very great pleasure of seeing Dr. Jenkins demonstrate his method. I had a better opportunity than ever before to comprehend the real merits of his material, and to understand, as I never did before, how much individual effort he has given to the making of those porcelains. You would be amazed at what he has spent in the perfection of the porcelain which we know as the Jenkins porcelain. None realizes how much effort has been given to that work, and I firmly hold that Dr. Jenkins will be hailed as the Palissy of his profession. We know how Palissy, in his effort to find out certain glazes, in his poverty even burned his bed and his furniture. Those of you who have visited the Cluny Museum in Paris, and have seen those glazes, will realize the spirit of art in that man's soul, and will understand how, when out of fuel, he even burned his furniture.

Porcelains for the teeth are on the same lines. They are perhaps even more interesting than they could be if considered purely as works of art, because they have added to them utilitarian value. They not only are beautiful in the mouth, which is the one place of all places where beauty should especially be found, but they also have utilitarian properties, and take the place of fillings which we have heretofore made from other materials.

I expressed to Dr. Jenkins some doubt as to the availability and safety of porcelains in the back of the mouth, and on the grinding surfaces of the molars and bicuspid. In reply he was very emphatic in saying that they had a saving quality on the teeth which we did not yet realize. He said he had observed that it was astonishing what lasting qualities they had, and how well those fillings were preserving teeth—much better than the average gold fillings. It was hard for me to accept that statement, because I had not yet ventured to use them in the back of the mouth to any great extent. I said I thought they were of the greatest value in the front of the mouth for esthetic purposes, but I was not ready to believe they could be made of such

value in the back of the mouth, and in hidden places here and there in the teeth; but now, after knowing more of the Jenkins material, I am inclined to think he does not overstate the matter and is not too hopeful. Do you realize how strong the Jenkins body is, and how very fine its texture? Until I went abroad the porcelains used in my office had been for the most part high-fusing, and I found them very often extremely brittle—so much so that I never ventured to use them much in the back of the mouth, or where much strain would be put upon them; but I take a different view now. I am satisfied that porcelains made from the Jenkins body have more strength than we have heretofore believed. He says he can cut glass with the edges of them, and if you make the trial you will see that it can be done. I think before going to Dresden I was a little in favor of the high-fusing, and now I think I am biased a little on the other side.

Dr. Jenkins and his assistants are very expert in getting the matrices out and getting exact edges, therefore making perfect fillings. I was impressed how truly this work is artistic work, and how much I have to be thankful for, to have lived to this time, when I can see the hope of having what has been my *bête noire*—the conspicuous display of gold fillings—banished from our practice. Dr. Jenkins says the colors can be matched with much greater accuracy than formerly. You can depend better than before upon the filling coming out to the shade desired.

We all have our hobbies—at least I hope we all have. I would rather have a hobby and have to give it up, and find I had made a mistake, than to have none at all. I would rather try the Jenkins body, even if I have to give it up afterward and admit failures. I do not think the reason for the use of the porcelain fillings in the back of the mouth—as being a time-saver and as a means of saving the worry and struggle and pain incident to putting in gold fillings—is, after all, the main thing. I really think Dr. Jenkins' method, without regard to

the ease of its use, is the best. I think you must have found, in your own experience with either the high-fusing or the Jenkins body, that many times your fillings after awhile look better than when you put them in. They come to the color of the other teeth after a short time from absorption probably, and I have noticed, as you must have done, that the little line of the cement which you see at the beginning does not after a while appear.

I am not advocating the Jenkins method because I was so royally entertained, or because Dr. Jenkins is one of the loveliest men I ever met, with a heart as fresh as a boy, but because I have to believe my own eyes.

Dr. RHEIN. Listening to Dr. Perry's remarks of his visit to Dresden recalled to my mind so vividly a similar experience of two years ago that I felt I was virtually traveling it over again with him. My experience was precisely that of Dr. Perry. I went to Europe two years ago, having no use at all for the Jenkins body and being an advocate only of the high-fusing material. I came back imbued exactly with the sentiments so beautifully expressed by Dr. Perry. I want to say for Dr. Perry's benefit, right here, that after two years of use of the Jenkins body, as far as inlays are concerned, and the relegation of all my high-fusing materials to the rear, that I feel very much stronger about the matter today than I did when I returned from Europe. I do not believe Dr. Perry will have to give up his hobby.

I want to say, in discussing that material, that I think it a mistake to expect to get the proper results from the Jenkins body by baking in the electric furnace. It is almost impossible to know and gauge the exact fusing-point (which is an absolute necessity) by any other means than with the gas furnace he supplies with the body.

While speaking on the subject under discussion, I want to mention—just for the sake of bringing out discussion on this point—a few things in the line of porcelain inlays that to my mind should be avoided. I have always felt, since porcelain is becoming more and more a

necessity and is more and more used by the profession, that we are in great danger of having this very valuable material abused as a filling material. This has been my view from the very outset, and every day I am more firmly convinced of its truth. I say that from the observation that I have had of porcelain inlays as they come along; as I see them at clinics; as I see them presented at different times by patients. It brings up this point: The student or practitioner who expects to take up the insertion of porcelain inlays as a method of preserving teeth in an easier way, is going to make the same failure with porcelain as he would have made with any other material. It is essential, in my opinion, for the permanent success of an inlay, that its adaptation to the enamel margins should be as nearly perfect as possible. This does not mean that it can be thicker at the margin than you would leave a gold filling at that point—one of the commonest faults made in porcelain fillings. It is in this respect that the advantage of the Jenkins method comes in—that after an inlay of the Jenkins material has been cemented in position, at a subsequent sitting the filling can be polished down to the enamel margin just as perfectly as could any metal filling. This is an absolute necessity, if you want to get the best results from a porcelain inlay. It is just as necessary that the margins should be a perfect continuity of an even plane as with any other filling. It is a mistake to suppose you can leave an overhanging or overlapping edge at the gingival border or approximal surface, or any other place, and expect that things will not adhere to it, or that trouble will not come there, however long it may be averted by means of the plastic material preventing the moisture from gaining an entrance between the dentin and the filling material.

This is perhaps the principal point that I wish to touch upon, as far as drawing out discussion is concerned—the advantage of absolutely finishing the edges. At the same time I do not want to take my seat before emphasizing this remaining fact, that the gold matrices will pro-

duce an adaptation infinitely closer than can be obtained by means of the platinum matrix.

It is unnecessary, in my opinion, to have a large amount of cement at the margin between the enamel and the edge of the porcelain. In fact, it is a possibility to have practically no cement edge show at any time after that filling is in position. I do not say that this can always be accomplished. I do say, however, that it is accomplished frequently, and if it be accomplished at any time it is simply a question of manipulative skill; it is merely a question of pursuing that skill to a higher point in order to get that result invariably. It is my belief that the time will soon arrive when a filling that shows any particle of cement between it and the enamel margin will be considered a defective filling, and will not be inserted by a conscientious operator, any more than he would put in a metal filling and leave it in such condition.

Dr. GEORGE EVANS. I have listened with interest to Dr. Perry's relation of his visit to Dresden, and from what I know of Dr. Jenkins that gentleman is fully deserving of all that Dr. Perry has said complimentary of him. But I do not think it is at all necessary to go to Dresden to discover the properties of Dr. Jenkins' porcelain, and see its advantages demonstrated. You can see that at any of the demonstrations given by his representatives in this country.

By the use of gold foil as a matrix we obtain easily and quickly the most perfect adaptation. I do not agree with Dr. Rhein altogether that it is impossible to obtain as close an adaptation with platinum, from the fact that after the first baking, and even after the second and third, you can re-burnish the platinum to the edge of the cavity, and in re-burnishing it you lessen its gauge down to almost infinitesimal thinness, and thus obtain a remarkably close adaptation. But this requires skill and consumes more time. As a matter of practice I have adopted the following method: When matrices are broken in adapting them to the cavity, I place the porcelain

body in the matrix before I remove it from the tooth, press it into position, brush off the surplus particles around the edge of the matrix, remove, and without investing—whether a gold or platinum matrix—carefully place it in the furnace and bake it; by this means I avoid a misfit caused by any rent. I then refit to cavity, and finish the subsequent bakings.

I think there is a great deal of merit in Dr. Jenkins' porcelain. I can tell you of instances in my own practice as to its lasting powers. Three or four years ago I placed seven inlays in the mouth of a lady whose teeth were badly disfigured by erosion. They had been filled with gold, and the fillings looked like a number of patches or small gold buttons on the surface of her front teeth. Last year I found that the erosion had extended farther down, and it was necessary to remedy it. I found it was almost impossible to remove the porcelain. Taking a diamond point, I cut out a new cavity, in the form of a segment of a circle, right into the inlay and replaced the eroded portion with a new inlay. When completed the line between the new inlay and the old could not be perceived. It looked like one inlay.

Dr. LEROY. The question of cements has not been touched upon, and I would like to say one word. Probably some of you are familiar with the particular application of what I am going to speak about. I have found it of such value that I wish to mention it here; that is, the "archite" cement, which came into such disrepute a few years ago as a filling for general use in teeth; as a medium for inserting inlays, however, I have found it the best thing I ever used. Archite came into practical disuse in my office because of its peculiar propensity for dissolving readily; but recently I have used it for the insertion of inlays. Its translucent property aids very materially in offsetting the cement line, almost obliterating it, and if the inlay fits the cavity well there is very little opportunity for dissolution of the particles; and I know of no cement at the present time that comes so near to being *the*

material for setting inlays as "archite" seems to be.

There is one other little feature that I have not heard spoken of before, and that is the use of inlays in extensive cavities where they involve approximal and molar surfaces—probably both approximal surfaces. I have made what I might term sectional inlays for those cases, building up one side of the tooth and then the other side, "keying" both inlays, and restoring the whole with a sectional porcelain filling or fillings, which would not be possible with a single one. This has given me much satisfaction. I have not been able to make a matrix without sacrificing too much tooth-structure, although I have tried; I was so unsuccessful that the idea of making the sectional inlay occurred to me, and it has solved the problem. It is particularly applicable, of course, to bicuspid or molar teeth. It has been very valuable to me, and I am glad to speak of it.

Dr. G. E. ADAMS of South Orange. I am reminded of a case that came before me a few days since. It was that of a lady who while in Europe had had an inlay inserted in a central incisor, and she told me it was done by the most eminent man in his profession in one of the large cities. He was an American dentist, and she went to him because she felt morally sure that she would have a very fine operation performed. The inlay was displaced during mastication. She was fortunate enough to save it, and brought it to my office the next morning. She found it in her mouth while eating candy, and thought she had bitten upon a pebble. Having cemented it into place, I found there was a projection large enough to catch a doubled and twisted piece of waxed floss, and there was room for it to rest upon at the cervical margin of this inlay. I called the attention of my assistant to the inlay, and before the patient had gone I went to his room for something, and he said, "Doctor, if that is what they do in Europe, I do not think they know how to put in inlays." I just give this as an instance that came to my mind when the necessity of marginal preparation was spoken of.

Dr. JARVIE. One or two points occurred to my mind during the discussion, particularly when Dr. Perry spoke. He thought the beauty of porcelain inlays was no less than many other works of art in the same material. It seems like a contradiction of terms to call a thing beautiful whose attractiveness consists in one's inability to see it or to distinguish it, but fine porcelain inlays are beautiful for all that. It is a case in which the greatest art is to conceal the art.

This view was brought very forcibly to my mind this afternoon. Some three years ago, a little girl, then ten years of age, who had been in Europe a couple of years, came to my office and had her teeth examined. In examining the teeth my instrument went back once or twice to the space between the upper central and lateral. There was a strange feeling to the instrument. The tooth was perfect to the eye, and I said nothing. Finally she said to me, "I had some porcelain fillings put in in Düsseldorf," and I found that the places which had felt unusual under the instrument were two porcelain inlays, and I had not discovered them. I saw these inlays again this afternoon, and they were beautiful in the sense I have spoken of—that I was hardly able to find them. I could not distinguish the line of demarkation between porcelain and enamel; the color was perfect, and there was no cement line to be seen at all, the union was so close. I see you are laughing, and I know you think I am romancing, but I have never seen anything nearly so beautiful in porcelain.

Dr. Perry spoke of the saving quality of porcelain as mentioned by Dr. Jenkins. I think that is quite reasonable as compared with gold or amalgam, for certainly where there is metal in the teeth there is always a possibility of galvanic action. The materials for a battery are there, and there may be destruction of tooth-substance from that cause. With porcelain in a cavity such a condition would not exist, and while the porcelain has no preservative property in itself, it lacks the destructive quality that a metal filling might have.

Dr. PERRY. The personal equation applies over the full surface of the cavity in filling with gold; that is to say, there will be personal accuracy or personal inaccuracy over the whole of the cavity in filling with gold. The human equation is reduced to a minimum in placing a porcelain filling, and is very much less than in placing a gold one, because a gold filling must be accurate in all its parts, and it is very much more difficult to make a gold filling accurate than to make a porcelain filling so. It is for that reason that Dr. Jenkins has had such remarkable success with porcelain fillings in teeth in the back of the mouth.

Dr. EVANS. I would like to give a practical point on the subject, not of my own observation—I think I got it from Dr. Ottolengui some time ago; he made the remark to me in discussing the gold and platinum matrices. I take the gold matrix and the Jenkins material, and after the first baking, readapt it to the cavity. I try it in, and gain considerable time by making the matrix and forming it in the cavity; I then pack in the body gently, remove it, and place it on a slab, the same as with a platinum matrix. Sometimes I apply the remainder of the material right into the matrix when it is in the cavity, and I can make it in the shortest time.

The PRESIDENT. When Dr. Perry spoke of the preservative quality of the cement I was reminded of what one of my old preceptors, Dr. S. B. Palmer, did

a good many years ago. A patient came to him with a filling in his hand, the same having dropped out. He reapplied it and found it was a very perfect filling and lacked only retaining points. Whereupon, it being an approximal filling, he replaced it with thin zinc oxychlorid cement. I saw it many years afterward, and it was a perfect filling. How much better could we have done it with oxyphosphate? That is not a new operation, but it was new with him.

Dr. LITTRIG. I have been trying for the past six months a material which Dr. Land sent me, which he called "Media." We paint the reverse surface of an inlay, and bake it to a red heat. It attaches to it and makes a surface from which the cement will not pull away. I have had good success so far, although it has not been a long time in use. You need not carry it to the margins, but put it on the lower part.

Dr. TRACY. Somebody has handed me a slip containing the announcement of the death of Dr. Jonathan Taft. I think it would be proper to move that a committee be appointed to draft resolutions and report to the society at the next meeting, in regard to the matter.

The motion was carried, and the president appointed as such committee Drs. Tracy, Jarvie, and Northrop.

There being no further business, the meeting adjourned.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

THE AMERICAN DENTAL CLUB OF PARIS.

Meetings of December 1902 and January and March 1903.

MEETING OF DECEMBER 1902.

THE meeting took place December 6th, at the office of Drs. Crane and Younger, with the vice-president, Dr. Crane, in the chair. Fourteen members were present, with Dr. Cowan as a guest.

Dr. YOUNGER reported a case of extensive absorption of gum and alveolar tissue, from the upper left canine to the molar, due to former pyorrhea. He attempted to restore the gum by grafting a piece taken from behind the third molar of the same mouth; he scarified the surface to receive the graft by rubbing with cotton saturated with lactic acid, making a raw surface for granulations; upon this he fixed his gum graft and fastened it in place with a coating of celluloid solution, but the piece came off. Then he tried another piece and stitched it into place, using fine cambric needles bent to proper curve after drawing the temper. *That* operation was a success. The graft contracted greatly, but he obtained an increase of tissue about equal to one-fourth of the bulk of the graft. He proposes to try transplanting gum from the mouth of a rabbit.

He further remarked as follows: We often find destruction of alveolar tissue between the teeth which stand in such relation as to afford lodgment of food and detritus in the pockets. Besides the discomfort thus caused, the gums are kept constantly inflamed and more and more forced back.

About a year ago I began experiments in such cases as follows: After cleansing the roots of tartar, etc., and treating them with lactic acid, I dry the parts as perfectly as possible, then rubbing with alcohol to dry the roots; I then place

over the parts bits of Japanese paper saturated with liquid celluloid, so as to form a protecting wall over the roots and edge of the gum. After that is done I take a thread and wind it around and tie it, to prevent all possibility of the paper getting out of position. The covering hardens and forms a perfect shield to the granulations, which grow up and fill the spaces between the roots. I have several cases in which the gums are growing in nicely.

Dr. HIRSCHFELD mentioned the necessity of the use of smooth, brilliantly polished gold foil for inlay impressions, as the ordinary mat or crystal surface gold used for fillings sticks to the inlay. He had asked a manufacturer to furnish him with Nos. 30 and 40 gold foil with perfectly brilliant surface. That made for him was most satisfactory. A specimen was passed around.

Dr. Hirschfeld also presented a device he had made and used to catch the impressions as they fall out of the cavities—to save much unnecessary handling, avoid bending, etc. The device consists of a small metallic cup, which fits into a ring at the end of a handle, all being about like a mouth-mirror, only instead of a mirror fitted into the ring, the cup slips into the ring and is detached when it contains the inlay, another cup being substituted.

The President invited Dr. Cowan, their guest, to speak upon his manner of taking impressions for porcelain inlays.

Dr. COWAN. I studied porcelain work with Downie, the inventor of Downie's furnace. I have been making inlays nearly every day since. But for the last eight years I have not used any matrix or used any metal when taking the impression and making the inlay. I pro-

ceed in this manner (I hope if you adopt it you will have the patience to learn it; it is very difficult):

For taking the impression I employ sticky-wax, first softening it and then forcing it into the cavity, and from that impression I make my cast in powdered silex one-fifth part to five of plaster. But there is a good deal of difference in the powdered silex you get; I cannot use silex that is too fine. After making the model or counterpart of the impression, I cover it with liquid silex, very thin, and let it set twenty-four hours before baking. Before putting the porcelain into the mold I dry my cast thoroughly, warm it thoroughly, and then proceed in the ordinary manner of filling up a matrix and baking.

The result is that I have an inlay that comes out with silex at the back of it but faced by the porcelain, and I think it fills better; there is no space between the porcelain and the tooth. It was very difficult to arrive at success and I worked for two or three years before I was satisfied; but I have now been using this method for eight years very successfully.

Dr. ROBINSON. At the general meeting of the British Dental Association held at Shrewsbury in May 1902, a clinic was given by a dentist showing how he fixes porcelain inlays without any rim or undercut in the inner part of the porcelain. It is a most ingenious method, and especially appropriate in cases where there is a very thin wall and where it would be difficult to make a neat cut, or where, even if it would be possible to do so, it would weaken the wall of porcelain so that it would be inclined to snap.

He takes the impression of the cavity with leaf gold. With this in front of him he simply puts a thin coating of porcelain all round the bottom of the cavity and bakes it right away. When taken out of the furnace he takes a mixture of an investing material; he uses a special kind of investing material that comes with the Mountford crowns. He places in the very center a little mound of this material, and then covers it entirely with another layer of porcelain, the cavity being quite filled. He bakes it, and when

it is complete breaks through the back and removes the little piece of investing material. I shall be very pleased at a future meeting to show you how it is done.

Dr. HAYES. I show you a binocular magnifying glass which can be bought from any optician. Dr. I. B. Davenport suggested its use some time ago for inlay work. You will see I have made a little modification which you will find renders it more efficient. I have added an elastic to go around the head and hold it in place.

I found the regular glass inconvenient because when over the eyes one could see nothing at one's side and was obliged to raise the glass to pick up the powder and then readjust it again for the fine work. So I simply cut two holes in the bottom, just in front of the eye-piece—a very simple modification but making a wonderful difference. Now with my glass in place I can see everything I wish—both below to take up what I want, and through the glass to work the inlay.

Dr. GILES mentioned the fact that adrenalin was being used in all the hospitals to arrest hemorrhage. It was employed in a solution of the strength of 1 to 1000, and applied with cotton.

Dr. HUGENSCHMIDT. If you wish to be sure of a clean aseptic dressing, dip a piece of cotton in an alcoholic solution of boric acid, and burn it until the alcohol is all burned out.

Dr. ROBINSON. In cases of the gum covering a cavity in which there may be possibly an exposed pulp to treat, much pain and annoyance will be saved by first applying trichloroacetic acid, which destroys all organic matter but not inorganic. It does not matter if it should touch the pulp. In a quarter of an hour you will be able to cut away without any pain. It is very useful in case of difficultly erupting third molars; just put a few crystals between the gum and the tooth.

Dr. YOUNGER gave a clinic in applying ligatures for drawing in and turning irregular incisors.

He also demonstrated the application of collodion and Japanese paper to pro-

teet the gums from food and irritation after treating them for pyorrhea.

MEETING OF JANUARY 1903.

The meeting of January 20, 1903, was held at the office of Dr. Wetzel; Dr. Da Silva, president, in the chair. Present as guests were Dr. Terry, formerly of Milan, and Dr. Cowan.

INCIDENTS OF PRACTICE.

Dr. HORTZ. Carbonized cotton as a root-filling has been advocated. I have tried something which is perhaps better. I take a pellet of cotton and dip it in iodine and leave it to burn, then introduce it into the roots. I have had no failure; the cotton does not fall to pieces, you can introduce it without difficulty, and perhaps the iodine may be a better antiseptic than boric acid, which has been suggested to us to be used in this way to obtain sterilized cotton dressings by Dr. Huguenschmidt.

Dr. DABOLL. I can see no use for carbonized cotton, etc., for filling roots, for we have in chloro-percha a perfect root-filling by which the finest pulp-canals can be filled with absolute certainty. I have filled the roots of worthless molars in the mouth and then pulled them out to see the result; the chloro-percha had gone to the apex. If you want an antiseptic use iodoform in the chloro-percha, or any other you like. I never let saliva enter a root under treatment; I first apply the rubber dam.

If the pulp be putrefied, I open and remove the debris, washing out with hydrogen dioxide till all bubbling ceases, dry with paper points, put in a little oil of cinnamon as far down as you can, and fill up with cotton and soft gutta-percha. Two treatments usually suffice, then I fill the root with chloro-percha, pumping it into the root and forcing gutta-percha points into this, pressing down with a warmed fine instrument.

Dr. COEN showed some cotton made of wood, having a great power for the absorption of moisture, and called *celluline hydrophile*.

Dr. J. R. DA SILVA then read the following paper:

THE USE OF ADRENALIN IN CONJUNCTION WITH COCAIN OR OTHER LOCAL ANESTHETIC.

I make no pretension of bringing before you this evening an original communication or discovery, but simply desire to state a few facts on the use of adrenalin in minor surgery as a hemostatic.

I have made quite a number of extractions within the last few months, and in the majority of cases have used the adrenalin by injecting it together with a local anesthetic which I have used for the last three years. In cases where I did not inject I have employed it afterward with cotton in the socket of the extracted tooth and the bleeding has been almost instantly stopped. It acts like magic, but its crowning effect is obtained when injected.

The action of styptics as a rule, iron perchlorid and others, is the coagulation of the blood as it flows from the arterioles, whereas adrenalin does not coagulate the blood but acts as a vaso-constrictor; the gums become pale and waxy in appearance invariably right up to the median line.

I prepare solutions of 2, 5, 10 or 20 per cent., and of the solution that I wish to use I draw into the syringe about 5 to 10 drops, if one or more teeth are to be extracted, and complete the filling of the syringe with the local anesthetic solution and place it in a glass of hot water to warm it, previously screwing the cap on in the place of the needle, and then proceed to inject on both sides of the tooth. If a vigorous massage of the gums be made with a finger of the left hand the needle can be pushed in without pain.

I then wait for from three to six minutes for complete anesthesia of the locality. The effect is more rapid if the patient be young. Previous to extracting I detach the gum. If this be done without any complaint from the patient you can count on taking out the tooth painlessly and without any bleeding whatever.

I find the 5 per cent. adrenalin solution quite sufficient in the majority of cases for anemic or lymphatic patients, whereas for a sanguine temperament I use the 10 per cent. or 20 per cent. solution according to the extent of the operation.

I saw a patient three months ago who had all the teeth extracted on the right lower jaw, to the canine, a fragment of the root of which had been left in and had caused continual suppuration. By using the adrenalin and local anesthetic solution I cut open the gum about two centimeters, laid bare the alveolus, which remained perfectly white, and with a double hoe excavator took the portion of root out; then put in two stitches, completing the operation without any bleeding whatever. In eight days it was completely healed.

Its use about the margin of the gums previous to putting in fillings or cementing porcelains, in cases where the gum has been accidentally wounded, is of great help to the dentist.

It has been used successfully in cases of hay fever, in America, by Dr. Wilkinson Jervey of Greensville, S. C., and Dr. J. Payson Clark of Boston. I used it myself for rhinitis a few days ago, and I assure you the subsidence of the congested condition of the mucous lining of the nose, and the relief I obtained, were marvelous. I first used it with an atomizer, then put in each nostril a large roll of cotton saturated in a 20 per cent. solution and kept them in my nose for about ten minutes.

Discussion.

Dr. HUGENSCHMIDT. I have used adrenalin for the past month with good results. I specially noticed a very beneficial result from using it for a case of periostitis around a root. You know how difficult it is to produce anesthesia in such cases. I injected one drop of adrenalin 1:1000 on one side, then a cocaine injection, and the extraction was painless. I used it also very successfully in treating a severe case of hemorrhage. I had extracted a temporary tooth in a

child, and very severe hemorrhage ensued. I took some of the solution and just injected it through the alveolus. After two minutes the bleeding had stopped.

Dr. DABOLL. Have you ever tried it on an exposed pulp? Has it any effect?

The PRESIDENT. Yes; if you are treating an exposed pulp and have hemorrhage in the tooth, this solution will stop it immediately. But I rather like to encourage the bleeding of pulps when working into a tooth. Sometimes when you are opening a tooth you see the blood oozing up. I think it should be encouraged a little; it allows the pulp to get rid of its congested condition. When it has gone on for a little time, then apply the adrenalin.

But I would certainly advise you to try this drug if you have a cold. Put two good-sized pledgets of cotton in the nose as far as you can get them and leave them there for ten minutes; you will find the congested condition of the nose disappears, and it will be a great relief to you.

Dr. WM. S. DAVENPORT. I was asking a throat-and-nose specialist his opinion about adrenalin, and he thought that the qualities of the drug were very much overestimated. He is not using it now; he operates on the nose every day nearly, but does not use adrenalin.

The PRESIDENT. In all cases you are bound to find men for and against. One will prefer to operate without flow of blood; another will like to have it flowing everywhere.

Dr. HAYES. Is there any secondary hemorrhage when the gum returns to its proper color?

The PRESIDENT. I have never seen any.

Dr. HAYES. How long does the white, anemic condition last?

The PRESIDENT. I have had patients in my office for half an hour after the injection and the pale condition still existed. I have not known any case where secondary hemorrhage has taken place. I once had a patient three and a half hours in my office to stop hemorrhage. We did not have adrenalin in those days.

I used iron perchlorid and big lumps of Stent's composition.

Dr. DABOLL. If I had known of adrenalin years ago I should have saved a man. I had extracted a root not more than one-fourth of an inch long from the lower jaw. The gum was very soft and spongy all round. After the extraction there was no hemorrhage to speak of, but in the night it commenced bleeding. He was seventy-eight years old. I was called to see him, and I stopped the hemorrhage, packing with iron perchlorid; the moment that got loose it began again. The physician who was there the second time I saw him said he was growing weak. He advised the cautery, which he applied, and that stopped the bleeding, but the old man only lived a week after that. I should have stopped the bleeding if we had had adrenalin then.

The PRESIDENT. Some eight years ago I was called to a man who had had a tooth extracted; the bleeding had commenced almost at once, and had gone on all day. The man had consulted his physician, who advised him to have the next tooth extracted. The first extraction had broken an artery and since nine that morning there had been two jets of blood steadily flowing. The physician extracted the second tooth; I got there at about 8 o'clock in the evening. I stayed there Sunday night, Monday all day and all night, and part of Tuesday before I stopped that hemorrhage. I made a plate of Stent's to keep up pressure, but, as soon as I touched it it began again. At last I went to the office and vulcanized a rubber plate and kept it in and watched it for two days before succeeding, and saved him. With adrenalin, I think I should have stopped the bleeding at once.

Dr. CRANE. I had a case two years ago of very tiresome hemorrhage. I had extracted two first molars on the left in order to make room for a regulating plate. Bleeding continued all night. I had used nitrous oxid; there was no difficulty at all, the tooth came out perfectly well; the roots were long. In the morning of the next day I was sent for and

told that the bleeding had continued all the previous day and all night. I found the patient all the colors of the rainbow. I was very much alarmed. I placed crystals of cocain on a cotton gag and the patient closed the mouth into it. The hemorrhage ceased almost instantly. But I have never seen the family since. The blame of the whole thing was put upon me; yet it was a thing which might happen to anybody. There had been no trouble about the extraction; the tooth came out perfectly clean. I have not extracted a tooth since.

The President announced the receipt of a telegram from the London Dental Club: "Heartly greetings and cordial invitation for February 14th." He also explained that the date had been changed to suit the convenience of members of the Paris Club, several of whom had promised to attend.

MEETING OF MARCH 1903.

The meeting of March 7th took place at the offices of Dr. Ryan. In the absence of the president and vice-president, Dr. Daboll took the chair. Professor Choquet was present as the guest of the club.

Notice of the sudden death of Dr. Conrath being reported, the President appointed a committee consisting of Drs. I. B. Davenport, J. J. Ryan, and M. M. Levett to draft suitable resolutions, and the following resolutions were afterward unanimously adopted by the Club:

RESOLVED, That in the death of Dr. T. W. Conrath we have lost a most esteemed, sympathetic, and worthy member, and the profession a most able and conscientious practitioner; and we hereby record our deep regret. It is further

RESOLVED, That a copy of these resolutions be sent to the widow of Dr. Conrath, with an expression of our heartfelt sympathy in her great sorrow.

INCIDENTS OF PRACTICE.

Dr. BURT presented models taken at various dates showing the eruption of a deciduous incisor at the age of eight years. Also a model showing five fully developed upper incisors.

He also presented a hot-air syringe which he preferred to the electric, its chief advantages being a spiral in brass which heats quickly and retains heat a considerable time. He also said he used the syringe to blow gold matrices out of the cavity, for inlay work.

Dr. Burt then showed another model which bore on a case similar to that presented some time ago at a former meeting by Dr. Choquet, as the model of his little girl's mouth. On that occasion Dr. Choquet had expressed his distress on noticing the rapid progress in his child's mouth of a state of things hereditary to his family and which had caused him considerable annoyance, viz, the deep shutting of the lower incisors into the upper palate. The case presented by Dr. Burt was one which he was treating in a manner similar to that which he had recommended Dr. Choquet to adopt for his child. The model showed that the lower incisors struck on the gum and that the chin was very much shortened. Dr. Burt had put four crowns on the four deciduous molars. The result was shown in another model, where it was seen that the upper and lower incisors had grown considerably and that the first molars had become longer. Something had been gained, and the face was much altered for the better. Having spoken with Dr. Choquet on the subject, however, Dr. Burt understood that he had not adopted this method, but had crowned the first molars. This method did not appear to Dr. Burt likely to produce such good results as the one advocated above.

Dr. CHOQUET said that he had certainly presented the case of his little girl at a former meeting and had stated that he had been alarmed at the rapid strides made in her mouth by the hereditary defect already mentioned. This deformity was so marked in his own case that he was obliged from time to time to have the lower incisors filed in order to bite with any comfort. He was determined to prevent such a state of things in his daughter's mouth, and had followed the advice given at a former meeting already referred to. But instead of covering the temporary molars he had

taken advantage of the growth of the lower molars, hoping that in consequence of the enforced opening of the buccal cavity the lower incisors would be projected forward and downward and would allow of a normal articulation. The result up to the present was all that could be expected, and Dr. Choquet hoped to effect a permanent cure.

Dr. W. S. DAVENPORT. Mr. President, this discussion is of great interest; at least it has been so to me, and I think it illustrates very well the two phases of this very important question which we have all been working at more or less. There seem to be two schools with regard to this matter; one looks upon this peculiar deformity as lack of development—too short a bite, and the other school seems to consider it to be due to too small a lower arch—in other words, too short a chin, as Dr. Choquet says; Dr. Burt says, too short a face.

Now, I think under the conditions, as these cases appeal to me—and I have been trying to crown teeth, to raise the bite, to jump the bite, for years—and as I understand it, Dr. Choquet in my opinion has come nearer to the right treatment (as I understand his treatment) than Dr. Burt. If I understand rightly, Dr. Choquet made his crowns in such shape that he suggested a forward articulation. Now in that case he is running no risk, because he is bringing all the teeth forward to their proper position, which is the important thing to do, in my mind. Dr. Burt has opened his bite, but he has not corrected the deformity; and opening the bite alone does not correct the defect. It is high time for us to settle that in our minds. We do not make quite so many mistakes as we did at one time; we do not extract as many bicuspidas as formerly, but I think most of the profession make the greatest mistake in these cases and cause many monkey faces in consequence. Dr. Burt has opened the bite and changed the face of the child temporarily, but has not re-established the articulation. The articulation—as you will see by the model—is abnormal on the right side, and I think Dr. Burt will be disap-

pointed by the result of his treatment, while I believe that in a year or two Dr. Choquet will have created a larger jaw and will see great benefit. Jumping the bite is an old thing; Dr. Choquet is doing it in his way, Dr. Burt has his method; personally I have another way of doing it; but it is my opinion that you must always bring the lower jaw forward in such cases.

Dr. WETZEL. From the model I do not think that there need be any changing of articulation; it seems to be perfect. The only thing is to raise the bite, as done. I have had several cases, and have showed models which I have had made at my place. I raised the bite, covering the temporary teeth with vulcanite plates. The results were not satisfactory, the children did not wear the plates regularly. I then tried covering the palate with vulcanite and letting the children bite on the front, but I think this is not a very good system, because as soon as the temporary teeth are not covered entirely the plate does not hold so well and might choke the child during the night; so I have tried tying the plate on. These children have faces like little old women, and whenever I have a case of that kind again I shall do as Dr. Burt has done here, cover the temporary teeth with crowns and cement them on, and I am sure that will give the best results. I think in most of these cases the molars have not sufficient space to grow, and therefore remain too short in the jaw.

Dr. WM. DAVENPORT (holding Dr. Burt's model). A word in regard to what Dr. Wetzel has said. He started by asserting that this articulation was normal—and what he has said will certainly hold good for a normal articulation—but if he looks at this model he will find that the articulation is certainly not normal; it is very far from normal, and never will be normal until the lower jaw is moved forward at least a quarter of an inch.

Dr. HAYES. I would like to ask Dr. Choquet if by crowning the teeth he did not intend at the same time to move the lower jaw forward.

Dr. CHOQUET replied that his object

was to bring forward the incisors. He hoped that owing to the continuous pushing forward of the tongue and the raising of the bite, the child's teeth will finally be pushed forward, and the mandible be not developed but pushed forward; he did not expect to obtain development of the mandible.

Dr. WM. DAVENPORT. Is the articulation normal in your child's case?

Dr. CHOQUET. The articulation is normal.

Dr. WM. DAVENPORT. Then it is another case entirely. If you are dealing with a case where the articulation is normal it is quite a different thing from Dr. Burt's case, where the articulation is not normal.

Dr. BURT. The case is similar. It is my apprentice who puts these things together—I have not time—and it is quite possible that the articulation of the models is not perfect. All I am troubling about, however, is raising the bite; then, when the permanent teeth are through I shall see what to do. The face of the child at present shows a very great difference; the parents are very much pleased. I am following the treatment of Dr. Martin of Lyons. I do not trouble about jumping the bite, pushing the jaw forward or backward; I am merely trying to raise the bite.

Dr. HAYES. Moving the jaw forward must come as a second stage. As I look at the models presented, the incisors strike too high in the palate, because the lower jaw strikes too far back, and the faulty articulation of the side teeth indicates the same cause. So, to correct it the jaw must be moved forward eventually. It is necessary to open the bite first because the upper incisors would otherwise interfere in moving the lower teeth forward to a normal articulation.

Dr. DABOLL. I should hardly consider it the work of an apprentice to put these together. Certainly, according to this model the articulation is not normal.

Dr. I. B. DAVENPORT. In this matter of articulation I think it is of the greatest importance to recognize what the articulation is to be, and what the position of the molars is, as soon as the

articulation has taken place, even as soon as the upper and lower molars have articulated. If the lower molar is back of the upper molar, or if the anterior cusp of the lower molar does not strike in front of the anterior cusp of the upper molar the articulation is bad, and it will never change of itself. It is the guide to us that the articulation will not correct itself. I therefore advocate the treatment of these cases as early as possible, even before the other teeth appear.

Dr. HAYES. But the treatment is the same—it is jumping, if necessary, early rather than late.

Dr. WM. DAVENPORT. I think it would be of extreme interest to the society to compare these models some time later. If you will give us the models of your daughter's mouth, Dr. Choquet, it will be of great interest to us.

Dr. DABOLL. Yes, if you could present us new models at the next meeting, Dr. Choquet, showing the change, it would be much easier to judge of the effect of the work you have done, as to its correctness, etc.

Dr. BURT. I should like to ask if Dr. I. B. Davenport approves of jumping the bite at six or seven years of age.

Dr. I. B. DAVENPORT. I should be very glad to see it done. I have jumped the bite the other way—backward—earlier than that; I commenced before three years old on my own boy. He wore a plate for a month. He had been biting forward before the deciduous molars had commenced to show. I put in a plate

and pushed his upper teeth forward, obtaining a development which has been permanent.

Dr. WM. DAVENPORT. I must say I am entirely in sympathy with what Dr. Burt was saying. I believe there has been some bad work done in the articulation of this model, because, with all due respect to Dr. Burt's ability in these things, I do not think what he states he has done quite corresponds with the conditions. I do not believe these teeth are articulated as they really are in the mouth—which brought forward my part of the discussion—because that right side stands off there, and the articulation is all wrong on that side.

Dr. BURT. I trouble only about raising the bite until the permanent teeth come through.

Dr. CHOQUET then presented some pathological crania, the skulls of various animals, having interest from a dental point of view inasmuch as they proved that animals in a state of freedom—taken, that is, from their own natural surroundings, and not from zoological gardens, etc.—show diseases of the teeth and dental defects similar to those witnessed in men.

Dr. COEN then showed a rubber-dam holder offering the advantages of requiring no weights and of being cleanly to use, it being held by a piece of thread which is changed for each patient.

I. B. DAVENPORT,
Editor A. D. C. of Paris.

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

Annual Union Meeting, Baltimore, May 1903.

(Continued from vol. xlv, page 981.)

ON motion Dr. Gingrich's report was passed, and

Dr. JAMES G. PALMER, of New York, read the following paper:

PREVENTION RATHER THAN CURE.

So much has been said concerning "extension for prevention" that it seems wise to consider for a time the possibility of preventing caries of the teeth without "extension."

As we understand it, the idea of extension is to present such a surface of metal to the friction of the lips and tongue, and to have the margins of the cavity so far from the point of contact, that they will be virtually self-cleansing. This would seem to admit at once the fact that cleansing, or being kept well cleansed all the time, would be a positive means of prevention.

In a recent issue of a medical journal it was stated that "It is to the study of preventive medicine rather than the study of therapeutics, or curative medicine, that the scientific physician of our time devotes himself."

We dentists have been studying for a long while how to cure the ills attendant upon diseased teeth. Our scientific practitioners of late have gone beyond that realm in the endeavor to ascertain the cause, not merely of a single disorder like pyorrhea, for instance, but covering the entire range of the various disorders and maladies which we are called upon to look after in our daily practice. Notably of late do we find Professor Kirk, Dr. S. A. Hopkins, and Dr. E. S. Talbot going into exhaustive research along the lines of causation, following the examples of

Miller, Leon Williams, and Professor Andrews, but going far beyond them into the minutiae of some of the lesions of the mouth and adjacent parts.

If the time has come when the scientific physician has learned to devote himself to the study of preventive medicine instead of curative, is it not well that we should pay greater heed to what our enthusiastic scientific searchers after truth have sought out for us? Shall we not learn, if we will, how to accomplish the much desired object of preventing, especially, caries of the teeth and consequent ills?

To this end some argue in favor of prophylactic treatment, as being the only sure and certain method which will lead to prevention. Dr. D. D. Smith of Philadelphia is the one particular and shining light in this direction, ably seconded by Dr. C. M. Wright of Cincinnati and others. While I do not agree with some of the details of Dr. Smith's work—details which I have heard him emphasize as very material—and while I believe that there may be more than one wash or aseptic lotion of value in such prophylactic treatment, I am bound to give great credit to Dr. Smith for what I know he has achieved. It has been my good fortune, in company with several other dentists, to see in his office, in the mouths of several of his patients, the results of his method of oral prophylaxis. These results have been marvelous in the extreme. It is his claim that his method will prevent caries entirely, if properly and intelligently persisted in at frequent intervals.

In a paper read before the Phila-

delphia County Medical Society in January of this year he says: "The treatment consists of enforced, radical, and frequent change of environment for the teeth, and perfect sanitation of all mouth-conditions. Experience having demonstrated that the most careful and painstaking are unable, with the agents commonly employed, as the tooth-brush and dentifrice, toothpick and dental floss, germicidal washes, or other agencies, to effect this end, the plan of forcible, frequently renewed sanitation has been instituted. In detail the process consists of most careful and complete removal of all concretions, all calcic deposits, semi-solids, bacterial plaques and inspissated secretions and excretions, which gather on the surfaces of the teeth. This to be followed by thorough polishing of all tooth-surfaces by *hand methods* (power polishers should never be used)—not alone the more exposed labial and buccal surfaces, but the lingual, palatal, and approximal surfaces as well, using orange-wood points charged with finely ground pumice-stone as a polishing material."

A little farther on he says: "In every instance in which this treatment has been instituted for the deciduous teeth, and in many cases of adults, there has been immunity from decay, and the teeth have shown marked change in structural composition."

Such treatment as described, Dr. Smith would maintain at intervals of about one month. My understanding is that unless monthly attention is given he does not expect very definite results.

Dr. C. M. Wright of Cincinnati, commenting on this subject (*Dental Summary* for December 1902, page 715) says: "There can be no question that dentistry is founded on hygiene. From the beginning it has been held that clean teeth are far less liable to disease than neglected ones, and yet the dental profession has slighted a fundamental operation in prevention, and devoted itself to more attractive and ingenious methods of cure and partial prevention."

Dr. Wright agrees with Dr. Smith in many things and compliments him upon

his work. He speaks of the difficulty to be experienced in impressing this doctrine upon our patients, and questions whether we could "change the methods and habits of our daily practice to meet these requirements." For this reason he advocates the establishment of a class of sub-specialists, suggesting that cultured women might be trained in this line. The closing of his article is significant: "I think each of us can prove, by a study of past records of patients whom we have treated from childhood, that if we had pursued the plan suggested, the expense to them would have been no greater and the results infinitely more satisfactory."

This statement appeals to me because it is so in accordance with my own feelings on this subject. Since hearing Dr. Smith and giving more attention to detail in this matter several cases have been under my observation of those who have been patients of mine since childhood—cases in which I am sure such faithful attention, if properly supplemented by care on their part, would have brought its own reward in the general healthfulness of the teeth and in the diminution of the amount of caries.

I do not, however, see how one can do as Dr. Smith does if he has a large practice and give each individual sufficient personal attention every month. I think Dr. Wright's idea of sub-specialists, whether it be as he has it, the training of cultured women in this one line, viz, "the polishing of the teeth and the care of the mouth," or the training of young graduates for the work, will sooner accomplish results in this direction than the individual attention of each operator.

In an editorial in the *Dental Summary* for November 1902 the statement is made in reference to the employees of a certain match factory, that "by the strict supervision over the oral cavity, phosphor-necrosis has been almost entirely stamped out, there being but four mild cases at present among the two thousand employees." Here are two thousand persons with dental organs "scrupulously clean, gums of normal tint, fine and healthy, and a clean mouth." Dr. Smith, in commenting on this, regrets that Dr.

Bethel did not give a plainer and more detailed description of the prophylactic treatment these people were subjected to. It would be advantageous to know the details of the methods so employed and compare them with Dr. Smith's. I had always felt that phosphor-necrosis was unavoidable to such employees, and this statement startled me not a little. Coming at a time when the matter of more careful cleansing and polishing of the teeth was under discussion, it made a profound impression upon me.

In a feeble and perhaps half-unbelieving way, I have tried to accomplish something along this line. While I am by no means pleased with what I have achieved thus far, I believe I have learned something, and that in such work as careful prophylactic treatment and teaching lies the hope of much success in the future in preventing caries.

I earnestly believe this matter should receive closer and more careful attention than in the past, and that we should not be satisfied with our so often superficial cleansing of the teeth, but should go over the ground thoroughly and radically as does Dr. Smith. You will notice that I have emphasized the word "frequently" in quoting from him. As nearly as I can determine, it is the frequency of the cleansing and the radical change in environment, coupled with the fact that he aims to remove that bacterial plaque that the tooth-brush so often does not reach, which constitutes his chief claim to success.

Referring to "mouth infection" in connection with his method of oral prophylaxis, Dr. Smith wisely says: "It is a matter to be recognized that relief from mouth infection is to be afforded through dentistry alone. Germicides will not—they cannot accomplish it. There must be positive and frequent removal of all septic conditions of the teeth and general maintenance of a most perfect state of asepsis for the entire oral cavity. This can be accomplished only through the most skilful manipulation of educated intelligent dentists."

I am convinced that this matter should be given more attention, and, if we older

men cannot get out of the ruts we have worked into, we can assist the younger men and see that they are taught in regard to it that which was omitted or neglected in our education.

Discussion.

Dr. H. C. THOMPSON, Washington. I have very little to say on the paper. It suggests to us the good we can frequently get from cleanliness in the treatment of the diseases of the teeth. We have, as shown by Black, these plaques on the teeth, and particularly on the buccal and labial surfaces and around the gingival borders. And the removal of these, if done properly, in nine cases out of ten will result in radical relief. If we allow erosion to go on, then cleanliness will not accomplish much. If we neglect these conditions we can do little good by cleaning. The radical treatment of these conditions must be "early and often"—it must be impressed on those who come early to come often. I am fully in accord with the suggestions offered in the paper.

Dr. W. W. DUNBRACCO, Baltimore. I was very much interested in the paper. I do not believe it calls for much discussion, but for emphasis. We all believe in the preservation of the teeth. I do not know of a paper that aroused more interest and earnestness in my own work in this particular than the one we heard from Dr. Smith two years ago. I believe the whole success of his work is due to the fact that he perseveres in this treatment until it is absolutely thorough in his own mind. I think a great many dentists feel they have not the time to give to this class of work, but we should all persevere in it, for we all recognize the importance of prophylaxis. I try to impress upon my patients the value of it and the necessity of their coming to me often. To prevent is easier than it is to cure. You may have trouble in inducing patients to return, and may have to send for them, but they can be educated to the necessity of it. Dr. Smith has a wonderful hold upon his patients and they come to him regularly. In regard to the success of the treatment, I remember one case of pyorrhea alveolaris which he

treated for an eminent practitioner in Philadelphia, in which the teeth were all very loose, but after his treatment for some months the teeth became very firm and strong in the alveoli. It is a subject that demands more serious attention from the profession.

Dr. E. A. BOGUE, New York. I was agreeably surprised at some parts of the paper, as it touched upon a good many points which are not frequently touched upon by dentists. The first matter to which allusion was made was "extension for prevention," of which we hear so much. I was pleased a short time since in hearing from Dr. Bryan of Basle, as speaking of "prevention of extension" as an alternative which ought to carry weight. But, when we speak of extension for prevention, what do we mean?—what does it present to our minds? Dr. Palmer was inclined to class all cavities alike, approximal and buccal with those in the sulci which we often meet with. We should separate these classes of cavities. We see many cavities in the sulci which come into the class which must be treated by mechanical restoration where decay cannot be prevented by this treatment. That, I think, we all recognize, and prophylaxis for those cases begins before the child's birth usually.

And that brings us to an operative procedure which in some presences I should hesitate to speak of, and that is the restoration not only of the original form of the teeth, but, in cases where the teeth are malformed, the restoration of the ideal form; and not only that, but the restoration of the arches, both upper and lower, to an ideal form; and that is more than we can do, and yet that is involved in Dr. Palmer's use of the word prophylaxis—anything that prevents. Still, how is such an arrangement as that going to prevent the action of bacteria,—how is it going to prevent the deposition of tartar? For those are the two conditions we combat. We know that where we have pyorrhea we almost invariably find tartar, so that where we are very sure of tartar we are very sure of pyorrhea. If we offer favorable conditions for the collection of tartar we offer places for the

lodgment of particles of food and for the development of bacteria with consequently approximal decay. Dr. Smith's treatment is for the prevention of this collection of tartar, etc., and I think he is doing a great deal to impress this doctrine upon our minds.

Dr. Palmer used a sentence which struck me most forcibly. In speaking of the enforced radical and frequent change in the environment of the teeth, this thought came across my mind, viz, that it is a valuable point in proving that a clean tooth never decays, and so an argument for cleanliness.

Dr. W. A. MILLS, Baltimore. Those of you who read the dental journals know how I stand on this question. The paper is one to be appreciated, especially by stomatologists. This treatment I have been giving for a good many years, and the consequence is that I have suffered more in the pocket from this than anything I ever did in my life. I have many patients who come again and again, and on examination find nothing to be done, so I brush their teeth and send them home. This is not only a perfect system for the prevention of decay, but also for the removal and prevention of the first cause of many pathogenic conditions of the system. I have had patients suffering from rheumatism in various forms who have been relieved or cured entirely by this treatment alone. If you follow it in the proper professional spirit, it is true you will be money out of pocket, but you will be of more real service to your patients.

Dr. E. C. KIRK, Philadelphia. I suppose like everyone else, I was interested in the subject-matter of Dr. Palmer's paper. I have also had the opportunity of examining in Dr. Smith's office patients showing the results of methods of prophylaxis which he advocates, and I heartily concur in everything commendatory of those results. I want again to recall the statement which Dr. Palmer quotes from Dr. Smith and to which Dr. Bogue referred, namely, the necessity for frequent change in the environment of the teeth as a prophylactic measure. This is true. It is also true that if

caries, and pyorrhea alveolaris, are produced by the activities of micro-organisms, it does not require the intelligence of a Philadelphia lawyer to know that it is necessary to get rid of the germs that produce them.

I would like to call your attention to another state of affairs in which the changing of the environment is equally as important, and with which the germ *per se* has very little if anything to do. And that is a little word which is giving us a new meaning to that term which the dental profession knew long ago—vitiated saliva. It is interesting to see how the intuitional sense of the practical man gets hold of what is the matter long before science comes along to say what is the cause of a particular condition. We are now getting to the point where we will be able to give a clearer and more explicit definition of vitiated saliva. I will warrant that if I conducted an examination here at this time, even in this intelligent audience, and asked in what way does vitiated saliva cause destruction of the tooth-structure, a good many would "flunk." What is the meaning of vitiated saliva? That is the problem we are working at.

Curiously enough, there are vitiated conditions of the saliva—conditions which are abnormally destructive of tooth-structure—with the production of which the bacteria themselves have nothing to do. The saliva is poured out through the salivary glands in a state capable of acting upon tooth-structure. We know this is the case in erosion of teeth. We are all familiar with that. I am pretty nearly certain that a great many of the cavities that we have, in certain mouths, regarded as cavities of decay, are not so at all, but are cavities produced by a rapid erosional process with which bacteria are not concerned directly. And that relates to the question of environment, because that environment is produced as a direct result of nutrition and the food habits of the patient. I would suggest to you a thorough examination into the food habit, particularly of young children, just at the period when they are shedding their

deciduous teeth and the replacement by the permanent teeth is taking place: The question of over-indulgence in carbohydrate food by children affects the teeth. There is no question that candy destroys the teeth. It does so indirectly, by so altering the saliva that the saliva destroys the teeth. We all owe a debt of gratitude to Dr. Michaels, originally of New York, now of Paris, for his great work in giving an impetus to the interest in this question; for this the dental profession should be very grateful to him. This investigation is finding out things about tooth-disorders that we never suspected. Only the other day I examined the saliva of a patient, and found it full of oxalic acid, and that man is having trouble with his teeth. All sorts of things are to be found in the saliva.

So, while prophylactic influences on bacteria are very important, they are by no means all of the story, and we must make a new division of cavities. Carious cavities which occur only under certain definite environments of the teeth in which lactic acid is the solvent—that type of tooth-destruction should be separated from those individuals who are pouring out into their mouths through the salivary glands saliva which of itself is a powerful destroyer of tooth-structure, decalcifying large areas, producing large cavities which we have heretofore regarded as cavities of decay. We will have to go back and see how a man's organs treat the food; study the waste products, and how to get rid of these waste products in the mouth.

Dr. PALMER (closing the discussion). I have nothing further to add to the paper except to thank Dr. Kirk and Dr. Bogue for bringing out the point of frequent change in the environment of the teeth. I would simply emphasize that one point, and call attention to the fact that that is the one particular point in Dr. Smith's work.

On motion the subject was passed.

Dr. A. D. McCONACHIE, Baltimore, read a paper on "Reflex Neuroses of Dental Origin as Manifest in Eye, Ear, Nose,

and Throat Diseases" (as published in full at page 941 of the December 1903 issue of the COSMOS).

The discussion of Dr. McConachie's paper was postponed until later in the session.

The meeting then adjourned until 8 P.M.

FRIDAY.—*Evening Session.*

The meeting was called to order at 8 o'clock by Dr. Wilson, president of the Maryland State Dental Association.

The first order of business was a paper by Dr. E. A. BOGUE, New York, N. Y., on "The Principal Molar in Man and its Relations to and Bearings upon the Other Teeth" (as published in full at page 605 of the August 1903 issue of the COSMOS).

Discussion.

Dr. B. HOLLY SMITH, Baltimore. I want to say that the association owes Dr. Bogue a vote of thanks for coming here and reading this paper and presenting these pictures. I have never been in the habit of extracting the first molars. We are all familiar with the teaching of Dr. Bonwill, who said that if the teeth were kept back in their proper places there should be no opportunity for the correction of irregularities—that the whole tendency of the teeth is to move forward, and the power behind them, the tongue, cheeks, etc., have a disposition to move the teeth forward. Now, if Dr. Bogue is right—and I think he is—that these teeth should at least be held in check, he has stirred some of us to a consideration of the relation of this influence, and to make an effort to keep these teeth back. Therefore I heartily agree with the suggestions offered.

Dr. Bogue is a most insinuating man; he does not dare come out and say what he means, he simply insinuates, throws a little circle out, and carries us with him. I am thoroughly convinced that he is correct, and I wish he would come out and say plainly what he means. I commend the paper very highly, and I feel under personal obligations to him for coming here and offering these suggestions.

Dr. W. W. DUNBRACCO, Baltimore. I would like to ask a few questions. I would like to know the doctor's method of reducing these first molars to their proper places in the arches, and whether he begins the correction of an irregularity as soon as the teeth are erupted.

Dr. A. J. VOLCK, Baltimore. I think the gentleman is a little out of order. Dr. Bogue in the beginning stated that he would not enter into a discussion of the methods of correcting irregularities, but simply speak of the influence of the position of this molar in the future irregularities of the teeth.

Dr. J. ROACH, Baltimore. I have enjoyed exceedingly listening to the paper, as it deals with a question which we have studied considerably. It is one of education, as Dr. Bogue brings out the physiological conditions of good, healthy, sound teeth, and also the conditions resulting from misplaced teeth. That is all right if Dr. Bogue can get hold of these children at an early age, but the actual question is how to induce the parents of these children to bring them to us early. If he can get these children at the ages of two and three years he might apply his principle that clean teeth never decay. But we cannot prevent decay if the parents do not instruct the children to clean their teeth themselves. In the majority of cases the children do not come to us until they begin to have trouble with their teeth. Only the other day a child came to me, nine years of age, who had never been to a dentist before; she had several irregularly placed teeth which could have easily been corrected had she received proper attention in time. There are numerous instances of this kind in which the malpositions are due to the temporary teeth never having been taken out, or by their being decayed down to the gum margin.

Dr. Bogue says we should never extract, but there are conditions which we must face in which it cannot be avoided. One instance that led me to favor extraction was a case in which Dr. Louis Jack extracted the four first molars for Dr. Hoffman's son, and if Dr. Bogue could see that case today he would say that it

was the proper thing to do. Along the line of education the question presents itself to us—How are we going to induce these parents to bring the children to us at an age when the teeth are being developed, and at which disturbing influences cause so much trouble? You have seen teeth that were improperly formed when they were erupted, and in which you could stick an exploring point before they came through the gum. Now, consider the back part of the mouth, where the second and the third molars are yet to come and where they hardly ever have sufficient room, and where the anterior teeth are in perfect condition, with these first molars decayed. What are you going to do? These are conditions about which I would like to learn.

This brings us back to the question of educating the parents. Until the parents are educated to bring these children to us in time, and the parents themselves are educated to teach the children to keep the teeth clean, we shall have to extract these molars. I have patients to-day in which I have extracted these teeth and I can show you good results. I read a paper about four years ago before this society on that subject, and I was hauled over the coals. I do not say extract all these molars, but I say that some must be extracted. How many here now have their first molars? I have not mine; I unfortunately lost them. In the beginning, when I should have kept them clean, I did not, and they went. Again, when we extract these teeth at a time when the second molars are coming into position, they will usually move forward and you get a fairly good occlusion. I wish Dr. Bogue could be here next Monday; I would like him to look at a case and tell me what to do. I do the best I can for these cases; I take impressions, and study the models. In the majority of cases, where the first molars are so far gone that they must come out, it should be done at about the age of nine, ten, or eleven years, according to the time when the second molar would be erupted and should come into place.

In regard to the question of heredity, there certainly are conditions which we

inherit from our parents. You see many cases in which the child will have teeth like the mother, and another child will have teeth like the father. There is a family in this city, a judge who has seven children; two have teeth exactly like those of the father, and the others have teeth like the mother's. This gentleman has his laterals wanting, and two of the children have their laterals wanting, but the others have a full complement of teeth like their mother, with perfect occlusion. I have often noticed cases where, the father having large teeth and large jaws, and the mother having small teeth and small jaws, some of the children will have the small jaw of the mother and the large teeth of the father. Now, I do not know whether these things occur from heredity or not, but they do occur.

Dr. C. W. STRANG, Bridgeport, Conn. I was taught by Professor Barker 'way back in 1865 that in the majority of cases it was good practice to extract the first molars, and in the early years of my practice I followed that principle, the results in some instances being satisfactory, but in many instances they were not satisfactory, because as I look upon those persons at the present time it seems to me that in some of the faces I can discover a lack, if you please, of character. There is not the character in the face that should be there, and I believe would be there had those first molars been preserved. For a number of years I have had charge of a case in which the first molars were extracted years before I had to do with it. It is the case of a very fine-looking young woman, I should say about thirty-five years of age. The articulation is very satisfactory indeed, but there seems to be something lacking in that face, and at first I could not quite make up my mind as to what it was. There was something of a recession of the inferior incisors, and in so far as the upper incisors are concerned they are tipping forward at the cutting edges. It seems to me that that face, if those first molars had been preserved, would have possessed more character, more force, and that the woman, although she is still a fine-looking woman,

would be still better-looking had they been preserved. It is also true that there are quite a number of approximal fillings in the back teeth, which might not have been necessary had these teeth been preserved. There is a class of patients who come to us at about the age of twelve, in whom we find these molars decayed in the fissures which were not perfectly fused, and we will find decay in progress to some extent. We often find on the occlusal surfaces of the lower molars large cavities. We find the buccal surfaces of these teeth sometimes defective. We know well that if these teeth are preserved it will be because they are kept clean and looked after continually. I think it was Dr. Lewis, the physical culture advocate, who many years ago said that a clean tooth never decayed. If the teeth are perfectly formed and kept clean they will not decay. The question is, How can they be kept clean? It may require constant attention to keep the approximal surfaces of the teeth perfectly clean. And so I say, in these cases where the teeth are prone to decay we should give the best attention, and often the best care that we can possibly bestow will hardly carry through these cases of approximal decay.

Do not understand me as being an advocate of the sacrificing of these molars, but I have seen cases where, speaking honestly, I would say that twenty years after the extraction of these first molars, the teeth in the mouth are in a generally better state than they could possibly have been had the molars been preserved.

Dr. M. F. FINLEY, Washington. I am very sorry that I did not get here in time to hear all of the paper. The part that I heard I enjoyed very much. I have known Dr. Bogue for a number of years, and realize full well that what he presents is worthy to be heard at any time, but I shall have to disagree with him in one statement; that is, that in *no* case should four teeth be removed from the mouth. There may be but one case in a man's practice, still such a case constitutes an exception to his rule. I have had one such case, where I deemed the only thing advisable to do was to extract

the four first bicuspid. This was not only my own opinion, but it was that of several of the older members of the profession in Washington, who confirmed me in it. I believe that it is extremely rare that such a thing is necessary, but, as I said before, there are such cases once in a while.

I cannot agree with Dr. Roach in the matter of extraction of the first molar; all things being equal, I should preferably extract the bicuspid. Of course his excuse for extracting the molars is probably as good as mine for extracting the first bicuspid; for instance, it was impossible to get hold of the patient at a time when it was practical to overcome the decay.

Dr. L. ASHLEY FAUGHT, Philadelphia. I agree with my friend Dr. Smith in that I think we would all have been glad to have had Dr. Bogue become specific, and tell us what to do under certain conditions. I am thinking at the present moment of a condition where the loss of the temporary teeth will possibly allow the sliding forward of these teeth until they are out of occlusion. It would be very interesting to know just what particular means should be adopted to put that molar back in the proper place, and just when it should be done. One has also to remember that in the correcting of an irregularity not only the bringing of the teeth to the proper place is to be considered, but means must be provided for keeping them in that place. Where a case involves the loss of the temporary molars, I think it would be interesting to know how to bring them back, and how to keep them there until the permanent teeth come in. As to the question of the extraction of the first permanent molar, I am rather in the position of those who would in all cases make an effort to preserve that tooth and not extract. I am a firm believer in what the essayist has set forth regarding this, and I know what he has done in regard to regulating the teeth, and I am convinced that his teaching is correct. I know that Dr. Bogue has, like Dr. Roach, made a habit of studying models made of these cases before making the first move. I have

had some experience in this myself, and I am free to say that up to 1885 I was an advocate for the extraction of the first permanent molars under proper conditions, as I was reared under the teaching of hereditary conditions. I did extract quite a number of permanent first molars after making models of the cases and studying them. These patients are still my patients; I have taken the trouble to take models of these cases after several years have elapsed and studied the conditions of these cases at present, and, gentlemen, there is not one that I do not regret. I am ashamed today to open a discussion in these families regarding the first permanent molar, because I have to face a positive mistake made in some member of the family. And from this backward study of the cases I am convinced that one will save his professional reputation, and in all cases of irregularity the result will be more satisfactory, if these molars are retained.

Dr. H. E. KELSEY, Baltimore. I would like to ask one question, and that is, When these teeth do not occlude properly, how is it possible to determine which one is out of position—whether the upper or the lower? I heartily believe in all that Dr. Bogue has given to us tonight. I have had opportunity to observe in several instances that he carries out the principles given us tonight. He has given many years of study to this question, and the conclusions presented here are the result of years of work on his part.

In regard to the determining of which of the teeth is out of position in malocclusion, Dr. Kirk read a paper some time ago—for which he apologized by saying that he had gotten it up on short notice, and would not care to go on record for everything he said in the paper—in which he said this might be determined by the position of the mental foramen in its relation to the teeth whether the teeth were erupting in proper position or not. This foramen is very easy to locate in the cadaver, but in the living subject it is very hard. It is true that in your own mouth you can locate the foramen by

pressure of the finger, but it is very difficult in other people. It may be that Dr. Kirk is right, and that we may be able to determine by this foramen when the teeth are erupting properly, but that is yet to be decided. I would like to know if Dr. Bogue has reached any conclusions in this respect.

Dr. E. A. BRYANT, Washington. I would like to say in regard to the question of heredity, that I have had a case within the last two weeks, a member of a family now gone to locate in Philadelphia—and my friend Dr. Faught may have an opportunity to see how heredity runs in that family. In the whole family of six girls there do not seem to be any teeth in proper place. I would like Dr. Faught, if he gets time, to look over them. Throughout the whole family the laterals are missing or deformed, and in the cases where they are present they are very small. In several of the cases where they are missing I have taken the trouble to have X-ray pictures made to see if the teeth were there, and they were not. With regard to the extraction of teeth, we are not all so fortunate as to have our patients at as young an age as Dr. Bogue's. Some of the younger members have patients who, when they come to us, have teeth in such shape that they look as if they had been struck by a cyclone. Dr. Bogue's theory is very pretty, but it won't always work out in practice. The extraction of the bicuspid I have always been opposed to; likewise that of the first molars, but there are a few cases in which they should be extracted. There are conditions that we meet with in which delaying extraction would not give us the best results, but there is no special rule to be laid down.

Dr. BOGUE. I will say that the results shown in that paper are the results of twenty years of work along this line. One gentleman said he made a habit of studying models of the cases. So do I; I have studied very carefully two or three thousand. I have more than two thousand models in my office at present; the rest I have thrown away. I have studied all of these, and that means a great deal. Dr. Bryant says that it is sometimes

necessary to extract the first molar. I think if he had been asked his reason for this, in many cases he would have to go back to a financial consideration of the question. May I ask the doctor if this is not so?

Dr. BRYANT. It may be in some cases, but the special cases that I referred to were where the cusps are nearly gone, or where the tooth has decayed to such an extent that its preservation is almost impossible. I believe in saving teeth, but there are conditions that I cannot save.

Dr. BOGUE. I will try to answer the questions asked in the discussion by referring to the several cases mentioned in the paper, which will probably answer them more clearly than I could otherwise. A young lady of sixteen came into my hands with the crown of the lower left molar gone, and the roots decayed to such an extent that they were separated. The roots of the lower right molar were abscessed. The upper right molar and upper left molar were both badly decayed. Now what should I have done? When I considered the possibility of what the result might be if I extracted that lower left molar, and that the girl was only sixteen years of age, I said to myself—and I think Dr. Bryant will agree with me: Even if I have to pay the cost myself of saving the tooth, I will save it. I treated it and got rid of the abscess, covered the exposed gum with gutta-percha, put screws in the roots, put a gold band around them, and filled with amalgam. The other lower molar was also treated, the abscess cured, and that was filled in the same way. The bill for the work was considered too high, and the second year she was taken away from me. Nevertheless I followed that case for ten years, from sixteen years of age to twenty-six. She became a married woman and a mother, and for ten years her teeth were all in occlusion. When she came into my hands she was nibbling on her incisors, was thin, pale, anemic, and listless. She could not masticate nor insalivate her food. When the teeth were properly arranged and restored to their natural forms and occlusion she at once began to improve in

health and strength, her figure began to fill out, and she became a fine healthy woman.

Dr. Smith speaks of holding the erupting teeth back. Sometimes this is necessary, but this is not what I meant. I meant to inculcate the bringing of the erupting molars into perfect occlusion, whether that implies a backward, forward, or lateral movement of either tooth. When the principal molars are in perfect occlusion there will rarely be any irregularity in any of the grinding teeth.

Dr. Dunbracco says that I said, Never extract. What I did say was that extracting can never be useful in the regulation of the teeth of children. It is easier to move a tooth in its socket than to force it across the space left by extracting a tooth, breaking down the walls of the alveolus before it as it moves. Let us illustrate the effect of extraction: Here is the case of a molar with a crown gone. Suppose we take this out, what will happen? We will have a tipping forward of the second molar, and the line of occlusion will be interfered with. Now, gentlemen, in the extraction of this seemingly useless root we have not looked far enough ahead. Dr. Faught says he is ashamed of every case in which he has extracted these teeth. I am, too, and my models taken year after year of the same case show my error. A good many years ago when I was lecturing at Harvard, one of the boys asked me if I would extract a tooth under such and such circumstances. I think it must have been a spirit not of myself, but beyond myself, that prompted me to answer in the way I did: I answered that the extraction of a tooth was an acknowledgment of our incompetency to save it. That has been my guiding star from that day to this, and for twenty years I have taken out only five good firm teeth.

Dr. Bryant says that the theory of non-extraction is "very pretty, but it will not work out." The theory is *non-extraction for regulating children's teeth*.

General McClellan once told me that he himself had to interfere to stop the needless amputation of arms and legs and other members, because the army

surgeons were so bent on operating, and excused themselves because they were on the field of battle.

Yet it is sometimes necessary to extract a tooth or amputate an arm, but neither should be done lightly or needlessly. More depends on full and complete dental arches than any mere mechanic realizes, and that is where our training as conservative dental surgeons comes to our aid and helps us to help our little patients.

Dr. G. L. WILCOX, New York. I would like to ask Dr. Bogue to show us the effect of extracting all four of the first permanent molars. He showed in the extraction of one that the effect would be the tipping forward of the second molar. Now, suppose you extract all four of them, will the doctor show us what will take place?

Dr. BOGUE. You would have a tipping forward of all the second molars in such a way that you would not have correct occlusion. What I mean by occlusion is the fitting of cusp to cusp to give the proper surfaces to grind the food.

Dr. WILCOX. The reason why I asked the question was because in a case such as you have mentioned, where the four molars are diseased, especially as badly as you stated, it has been my policy to extract these four molars and depend upon the second molars, upper and lower, coming forward and taking the proper place. I have extracted such teeth at the ages of fourteen and fifteen years, and these remaining molars have come forward and taken the proper place and have given excellent occlusion.

Dr. BOGUE. Dr. Kelsey has asked how to determine which is the dislocated molar, the upper or the lower. Well, I do not know. I do not know very much of the subject, and what I do know seems trivial when compared to what should be known. I am not prepared to answer what Dr. Kelsey has asked. I hope he will go on with this work and find out himself. It may be that Dr. Kirk has struck upon the right method of measurement, by means of the mental foramen.

With regard to the methods of correcting these malposed teeth, while I said

in the beginning that I did not intend to discuss this, I will say that I think the reciprocal anchorage principle of Drs. Baker of Boston and Case of Chicago is the best method we know of for correcting these dislocations anteriorly and posteriorly.

Dr. Strang wants to know whether it is possible to give the constant attention necessary to keep the approximal sides of teeth clean in some cases. I have in my care as a patient a family whose mother I had before her marriage. The family consists of seven children, five of whom are married and have children of their own. When I came down to a certain period in the family I found a girl who did not have the energy to keep her face clean, to say nothing of the teeth. Many of the teeth had cavities in them when they came through the gums. You remember the first picture I showed you, where there were cavities before the teeth were erupted. That is what she had. There were six or eight in every tooth of her mouth as they came through the gum. I should think that case is bad enough. That girl has never lost a tooth and never had a toothache. She is married now and has every one of her thirty-two teeth, and I think she will keep them.

Dr. Smith speaks of Dr. Bonwill's theory of holding the teeth back. I want to say that the bulk of the regulating appliances draw the teeth forward. There are a few cases in which the molar teeth want to be drawn back, but in the majority of cases the appliances are to draw the teeth forward in order to bring about the enlargement of the arches. There are a very few arches too large, and a great many too small. My principal object in bringing this subject before you is to have you study it with me, and demonstrate the value of this theory for yourselves. I thank you very much for the discussion of the paper, and for your kindly attention maintained for so long a time.

On motion the subject was passed, and the meeting adjourned to meet at 10 o'clock Saturday morning.

(To be continued.)

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EDITORIAL DEPARTMENT.

THE "FÉDÉRATION DENTAIRE INTERNATIONALE."

THE history of the birth and subsequent activities of this organization, representing a great international movement toward the harmonization of the world's dental activities, is already well known from its published Transactions and the reports of its meetings which have appeared in our periodical literature. Organized at the close of the Third International Dental Congress in Paris in 1900, it has in the brief period following that event not only awakened a world-wide interest in its purposes and work, but has already accomplished much toward achieving the objects for which it was created.

When we consider that the first association of dental practitioners in the world's history for mutual improvement, the interchange of ideas, and the uplifting of their profession was organized in 1839, the step only sixty-one years later to an organization having for its object the application of the same principles to the world's dental profession seems indeed a stupendous one. No more striking evidence of the rapid development of associative effort could perhaps be found in the history of any other calling of analogous character, and while we may well applaud the achievement, it is at the same time the part of a reasonable conservatism to give attention to the future possibilities of the tendency which has materialized it, and to so safeguard its activities that they may work out the highest welfare of the dental profession as a whole.

The circumstances which led to the creation of the International Fed-

eration are of vital interest and importance. Reference is here made, not to the material incidents which at the Congress of 1900 called the organization into being, but those sentiments of international confraternity and the desire for a more general harmonization of dental ideals and methods which the Congress of 1900 and the international gatherings which preceded it had engendered. It was the growth of the sentiment of association for unification which was felt among the representatives of all nations that found its expression in the organization of the *Fédération Dentaire Internationale*.

No idea involving a great principle comes into being full-fledged and functionally complete. It needs to ripen and grow and be tested by circumstance and experience before its best results are possible. In the very beginning of this organization a careful consideration of its policy and a definition of its purposes, its powers and limitations, became of vital importance to its continued usefulness.

Preconceived notions as to the purpose and meaning of associative effort based upon experience in national and local organizations were found to be inapplicable to associative effort in its international aspect. Gradually it seems to have become clear that the legislative factor which to a greater or less degree is an influence exerted in all other dental organizations is an impossible element in the international relation. In the evolution of the organization of the plan of the *Fédération Dentaire Internationale* two years passed before the conception of the limitation of its activities to the advisory function exclusively and the elimination of the legislative feature was clearly crystallized in a formal declaration of principles. At the Stockholm meeting in 1902, in the address of President Godon, was enunciated the fundamental principle upon which alone this great international expression of associative effort must accomplish its purpose. So clearly was it stated that we here quote it in full:

Each country depends upon its habits, historical evolution, and laws, and as all these conditions differ greatly, our International Commission cannot pretend—as our colleague Professor Hesse of Leipzig has stated—to do anything beyond expressing opinions and giving advices which have no real authority, but which have, however, a certain moral influence because of the standing of the members of the Federation, and may therefore be taken into consideration by those qualified in each country to voice decisions of legal power. Your functions are hence limited to those of a great international advisory council on dentistry.

To the principles set forth in the foregoing declaration we fully and unqualifiedly subscribe, for we believe that the time has certainly arrived when the development of dentistry and the practical definition of its status in relation to other professions and to society at large can be best achieved by just such a system of international conferences as the organization of the Federation has undertaken to carry into effective operation. The fact is undisputed that the educational and legislative factors which fundamentally influence our professional growth and our practical results

are as yet in a more or less inchoate state. Especially is this true when we compare the ideals of the several nations with respect to these matters.

It may be true that each nation has developed the system of education and practice which it deems to be best adapted to its needs; yet, on the other hand, it is also true that each nation is compelled by the inexorable forces of evolution to readapt its educational ideals to constantly changing conditions, be the changes never so gradual. The new must supplant the old in dentistry as in all else, and that type of so-called conservatism which would rest satisfied with a given achievement, making no further effort toward improvement, is like the man who struggles to the head of a procession and then refuses to march another step. He becomes an obstructionist and a useless cumberer of the soil that society promptly removes to make room for the more progressive elements.

The purpose of the Fédération Dentaire Internationale is to bring about greater harmony of ideals upon the best plane of professional activity, and its tendency is therefore toward international unification. Let us consider this proposition with care in order to avoid a misconception which may easily prove fatal to the interest which such an important principle should properly command.

Unification and harmonization are terms which of late have been much in evidence with regard to educational and legislative matters in dentistry. Much has been written and said favorable to the practical realization of the conditions represented by the underlying sentiment common to both. Enthusiasts have seen in unification of education and legislation the cure-all for most of the difficulties with which dentistry as a profession has to contend, but it should not be forgotten that unification *per se* may be anything but an unmixed good—indeed, it may be a positive evil unless based upon the best possible achievement and the highest principles adapted to the case. Society furnishes numberless examples of unification upon entirely false conceptions of what is right or best. The myriads of creeds, 'isms, and 'pathies that with more or less aggressiveness force their beliefs and dogmas upon a long-suffering public are instances of self-satisfaction with personal ideals and of unification upon principles which those not of the same faith or creed regard as erroneous. Hence it seems clear that if we are to achieve unification of our educational and legislative ideals in dentistry through an international series of conferences, our first object must be, not unification, but the evolution of ideally correct principles and harmonization upon the best possible plane of achievement and purpose. That being accomplished, unification must follow as the inevitable consequence.

We have referred to the tendency in the majority of efforts at unification to make that end the primary object, and it seems clear that whenever that has been the case the error of placing some restrictive limitation upon further development has been included. A creed or code of laws, a constitution or articles of agreement must be subscribed to,

which while conserving for a time the unity of the organization, inhibits its development beyond the originally prescribed limits of its activities. The necessities of the case make such a plan desirable to a certain extent in our national and local organizations; with such an organization as the *Fédération Dentaire Internationale* it would not only be impossible, but would at once defeat its purposes, so definitely stated by its president in the words we have already quoted.

There can be no question of the desirability of "a great international advisory council on dentistry"—an arena in which may be tried out by critical comparison the ideas of the leaders in dental thought in all nations; where the pure grain may be sifted from the husk, errors may be eliminated, and the best which each nation has to bring may be at the service of the others. The growth of dentistry has developed it beyond national geographical limits, and the world's dentistry should and must have its organized associative expression, just as nations, states, and municipalities have heretofore had.

The international movement must, however, be forever safeguarded against the tendency to develop a legislative, dictatorial, or controlling attitude toward the national factors which may compose it. The declaration of the president of the Federation unmistakably voices the same opinion, and in our judgment the organization will stand or fall accordingly as it adheres to that declaration or ignores it. As a great international advisory council on dentistry, the nations of the earth must give in their adhesion to the principle for which it stands. As a legislative body affording an opportunity for the centralization of power to politically control national activities from an international standpoint it would be a gigantic failure—a possibility which if born at all were better still-born.

The position of the National Dental Association of the United States with respect to the purposes of the Federation is in entire harmony with the principle set forth in the presidential address at the Stockholm meeting, and this attitude is embodied in the resolution passed at Asheville in July 1903, providing for a delegated representation of the National Dental Association at the meeting of the F. D. I. to be held in St. Louis at the time of the Fourth International Dental Congress. The resolution is as follows:

RESOLVED, That five delegates be appointed by the president with authority to represent this Association at the meeting of the *Fédération Dentaire Internationale* which is to be held in St. Louis, Mo., in connection with the Fourth International Dental Congress in 1904; and further

RESOLVED, That these delegates be and are hereby instructed to limit the affiliation and co-operation of the National Dental Association in the policy and work of the *Fédération Dentaire Internationale* strictly within the lines of an International Advisory Council.

The Federation is committed to the proposition of conducting its work in a manner and by methods which will not interfere with national interests or arouse local susceptibilities. It is opposed to all attempts at

the centralization of power; it asks support of its effort to establish a great international clearing-house of ideas to be digested in conference and assimilated afterward at the option of the participants. We contend, therefore, in view of these premises, that its claims to support by all nations are well founded.

In connection with the Fourth Congress a meeting of the Federation will be held, and the future of the Federation will become one of the important subjects for discussion and determination at that time. We sincerely trust that its prospective usefulness to the whole world of dentistry may be fully recognized, and that by wise counsel and good judgment its activities may be so safeguarded from any tendencies based upon personal or political interest that its tremendous power for bringing about professional harmony on the highest plane may be successfully realized.

DR. J. FOSTER FLAGG.

WE print at page 78 of this issue a full and interesting biography of the late Dr. J. Foster Flagg written by Dr. Wm. H. Trueman, whose experience as a dental historian and whose friendship with and sympathetic appreciation of Dr. Flagg through many years of personal and professional relationship have eminently qualified him for the work.

The passing of Dr. Flagg is an event of more than ordinary significance in dentistry. He was one of the group of pioneers who, if not concerned with the incidents surrounding the birth of our profession, were concerned with its development during the period of its early adolescence, and who with devoted fraternal, even paternal, care and love have guided its destiny on to a vigorous and virile manhood. Garretson, Taft, Barrett, Flagg—names that suggest a large potentiality in the upbuilding of dentistry—are now but memories, and the personnel of leadership is rapidly being rewritten in new terms and the burden falling upon shoulders as yet untried.

The public life of Flagg is known to all. Many will bear testimony to his kindness, generosity, helpfulness, and perennial willingness to forgive and forget the bruises and chafings of professional combat. But there are those who were taken to his heart of hearts, who knew and loved the real man—the side of which Browning speaks when he says:

God be thanked, the meanest of his creatures
Boasts two soul-sides—
One to face the world with,
One to show a woman when he loves her!

It was this tender side of Flagg that glorified his personality and bound him with hooks of steel to those who really knew him. To all such, hail and greeting! for they know the spirit of that broader fraternalism of which he was the concrete embodiment and that faith which to him was the "unfaltering trust" that carried him smiling and courageously on to the eternal.

BIBLIOGRAPHICAL.

A MANUAL OF THE INJURIES AND SURGICAL DISEASES OF THE FACE, MOUTH, AND JAWS. By JOHN SAYRE MARSHALL, M.D., former Professor of Dental Pathology and Oral Surgery and Emeritus Professor of Oral Surgery of the Dental Department of Northwestern University, etc.; President of the Examining Board for Dental Surgeons, U. S. Army. Second Edition, revised and enlarged. Philadelphia: The S. S. White Dental Mfg. Co., 1902.

Since the publication of Garretson's voluminous work on oral surgery no other book has received the recognition and approval that has been justly bestowed by medical and dental authorities on Marshall's treatise on oral surgery. The comparatively rapid exhaustion of the first edition of this work, and the fact that it has been adopted by a number of leading dental schools throughout the country, are evidences of the popularity of the book, this being doubtless because of the clear and explicit style in which the author has treated almost all the subjects within the scope of oral surgery.

The book is divided into two parts, embracing sixty-six chapters. The first and second chapters are devoted to the study of what the author terms "Surgical Bacteriology," and here he discusses not only the low forms of life concerned in the process of pyogenic infection, but also matters relating to elementary bacteriology and bacteriological technique

which, strictly speaking, should not form part of a treatise on oral surgery, as it is rational to presuppose that the student who takes up the study of oral surgery has already become familiar in the course of his professional studies with microscopy and bacteriology.

Chapters III, IV, V, and VI are entirely taken up with the study of inflammation, which is fully and explicitly discussed, especially from the viewpoint of surgical pathology. The remaining chapters in Part I, from Chapter VII to Chapter XVI inclusive, are given to the general consideration of such important subjects as abscesses, ulceration, traumatic inflammatory fever, pyemia, erysipelas, tetanus, shock, and collapse, together with ligatures, sutures, and suturing.

In the chapter on Shock and Collapse the author devotes particular attention to shock resulting from dental operations. Unfortunately, dentists do not as a rule take into serious consideration the possible injurious results of long sessions at the dental chair, and undertake to insert fillings so located and of such magnitude as to require two and perhaps three hours for their completion. Many are the cases on record in which most dangerous results have followed such long and tedious dental operations. Therefore Dr. Marshall's discussion of this subject, and his advice as to treatment and prevention, are worthy of the attention of all practicing dentists, especially of the advocates of large gold

restorations, inasmuch as a considerable proportion of cases of shock of dental origin occur as the result of the intense fatigue and mental strain to the patient incident to the insertion of large contour fillings.

In Part II, which is subdivided into fifty chapters, are treated almost all the disturbances pertaining to the province of oral surgery, and several other subjects in general surgery a reasonable knowledge of which is indeed a necessary requirement in order to thoroughly understand the surgical pathology and treatment of localized oral disorders.

In the chapter devoted to Stomatitis we regret that absolutely no reference is made to that type of stomatitis induced by the elimination of mercury through the oral mucous membrane.

The chapter on "Actinomyces Hominis" is unusually interesting because of the rarity of actinomyces in man. The author discusses in a clear and concise way the pathological manifestations in man of infection with the ray-fungus, and gives, besides indications for diagnosis and treatment, an interesting historical survey of this malady since the statement made by Professor Dick in 1833 to the effect that the disease was known to affect human beings. The chapters on Diseases of the Maxillary Sinus are equally clear, and contain much information that will prove valuable to anyone undertaking the treatment of antral sinusitis who may not be thoroughly familiar with that particular field.

In the author's discussion of Trifacial Neuralgia we notice that in considering the etiology of tic douloureux no reference is made to those cases arising in individuals having edentulous jaws, and

produced by compression of nervous filaments along the alveolar border by calcific matter deposited in the vascular canals. This theory was advanced by Gross of Philadelphia, in 1870, and treatment undertaken by him upon this basis, viz, by removal of the alveolar border of the affected area, brought about the cure of some cases.

The author's presentation of the subject of Tumors in general, and of tumors of the mouth, face and jaws in particular, is certainly masterly. The characteristics, diagnosis, prognosis, and treatment of every variety of neoplasms are carefully analyzed, and these chapters may be said to constitute a standard dissertation on the subject.

As the author states in the preface to the first edition that Part II is devoted to the more common injuries and surgical diseases which are associated with the face, mouth, and jaws, and as in the preface to the second edition this statement is not retracted, we cannot account for the absence of any reference whatever to the subject of extraction of teeth. This topic is certainly one strictly within the scope of oral surgery, and its consideration should be a prominent feature of a work on oral surgery for dental students.

Apart from the omissions to which we have referred we have only words of commendation for Dr. Marshall's work, which we believe will continue to occupy in dental libraries the leading position it has already gained since the appearance of the first edition in 1897. The book is profusely illustrated and the high quality of the typographical work adds materially to the value and attractiveness of the book.

J. E.

VOCABULARIO ENCICLOPEDICO DE ODONTOLOGIA. "Encyclopedic Vocabulary of Odontology." By V. PEREZ CANO and J. GARCIA Y GARCIA; edited by Dr. FLORISTAN AGUILAR. Volume I: A—L. Madrid, 1903.

The dental profession of Spain and the other Spanish-speaking countries is to be congratulated upon the acquisition of this comprehensive volume on dental

terminology. The authors were led to the preparation of this work from consideration of the fact that medical dictionaries in Spanish—or in any other language for that matter—contain little information of value to dentists. The clear and large type used throughout the text renders reference easy, and the entire make-up of the book is in harmony with the quality of its contents.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Schweizerische Monatsschrift für Medizin, Chir., Zahnheilk., etc.*, Basle, Oct. 1903.]

THE USE OF THYMOL IN DENTISTRY.

By DR. THEO. DILL.

Dr. Dill comments favorably on the use of thymol in dental therapeutics. This agent even in concentrated solution does not exercise any detrimental action on either the hard or the soft tissues of the tooth, and its disinfecting power exceeds that of any other agent in solutions of a strength that will not affect the oral or dental tissues. Thymol is indicated particularly for the disinfection of root-canals. In the case of diseased and partially devitalized pulps thymol brings about complete death of the organ without undue pain. In cases of sensitive dentin concomitant with deep caries the purpose of thymol medication is twofold, inasmuch as it will reduce the sensitivity and will disinfect the pulp. Its use in pulpitis is equally productive of good results, as it reduces the inflammation and the pain incident thereto.

For capping exposed pulps the author recommends a combination of thymol, xeroform and cocain. The thymol crystals are rendered liquid by admixture with alcohol and the two other remedial agents are then incorporated. This method is applicable only in cases of non-inflamed exposed pulps.

The author recommends the filling of root-canals with thymol. The canals are filled

with the crystals, which are then melted by means of a warm smooth broach. If the canal should happen to contain pulp-remnants which cannot be removed by mechanical means, the thymol paste will render them harmless.

In inflammations and ulcerations of the oral mucous membrane thymol in solutions of various strengths reduces the inflammatory state and induces the growth of healthy granulations.

Finally the author recommends it for filling up the apical foramen in the process of root-canal obturation.

[*Lancet*, November 14, 1903.]

A CASE OF DEATH UNDER NITROUS OXID. By MR. NORMAN BENNETT.

Mr. Bennett reported before the Society of Anesthetists the case of a patient, aged seventeen, who suffered from enlarged cervical glands. He showed no dyspnea, and had had nitrous oxid administered a few days previously without any apparent unfavorable symptoms. Nitrous oxid with air was administered again for the extraction of teeth. the face-piece was removed before stertor occurred. The patient became more cyanosed, and then ceased to breathe. During artificial respiration several spontaneous attempts at respiration were made. An attempt to perform low tracheotomy was unsuccessful.

It was afterward found that the patient had been suffering from dyspnea associated

with stertor, and had had respiratory difficulty on another occasion when nitrous oxid had been administered. The autopsy showed that there were enlarged glands in various parts of the body, and that the diameter of the trachea was reduced by one-half. The heart muscle was degenerated.

[*Giornale di Corrispondenza pei Dentisti*, Milan, November 1903.]

OPERATIONS PAINLESSLY PERFORMED BY IRRADIATION OF BLUE ELECTRIC LIGHT. (EDITORIAL.)

In the Blagovechensk Hospital two operations have been recently performed painlessly under the influence of blue electric light. Dr. Ninine of the Nicolas Hospital of St. Petersburg had already reported the anesthetizing influence of blue light (see DENTAL COSMOS, vol. xlv, page 673) and his satisfactory results are now confirmed by the two cases here reported.

[*Dental Record*, London, November 1903.]

A CASE OF REPLANTATION. BY W. DYKES.

Mr. Dykes reports the case of a boy who had four of his upper incisor teeth knocked out by the impact of a brick thrown at him. The little patient was brought to Mr. Dykes, who replaced three of the dislodged teeth, as one of the laterals could not be found. They became thoroughly firm, and remained in position for twelve years, when again through an accident the two central incisors were knocked out. The lateral remained in position. Before the implantation the teeth were rinsed in carbolic acid. No splint was used, and the teeth were held in position by means of silk ligatures.

[*Journal de Médecine et de Chirurgie*, Paris 1903.]

FEAR AN IMPORTANT FACTOR IN COCAIN POISONING. BY DR. BOUR.

Dr. Bour has studied the poisonous effects of cocain and has embodied the results of his observation in his thesis at the Faculty of Medicine of Paris. By comparing the statistics compiled by Bour with those prepared by Falk and Delbosc several years previously, it is found that the number of fatal cases has decreased markedly in recent years, which may be accounted for on the supposition that the proper rules for the administration of cocain are better understood today. A very interesting point in cocain administration is that the effects of the drug vary markedly in

different individuals. Some support without any perceptible inconvenience large doses of the alkaloid, while in others the smallest quantity leads to dangerous phenomena. The reason for this variation in action has not been as yet satisfactorily explained.

Among other factors responsible for this difference in action, fear is one the importance of which has not been thoroughly understood, and, as Mosso has already pointed out, it provokes spasmodic vaso-constriction which results in anemia of the peripheral cerebral organs, in paralysis of the motor apparatus, and in spasmodic contractions of the involuntary muscles. Respiration becomes irregular, the rate of cardiac activity is increased, the pupil is dilated through stimulation of fibers from the sympathetic, and finally paralysis of the voluntary muscles, often preceded by convulsions, sets in. The physiological effects of fear are analogous to those of cocain, and it is therefore logical to conclude that both fear and cocain act in a synergetic way. Poisoning in a timid person may be brought about with one-half the dose of cocain that would be required to produce the same effects in a normal person.

Fear alone may cause serious syncope, as evinced in the case of a patient who, being terrified by the thought of having to undergo cocain injection, fainted and presented serious symptoms after the injection of ten drops of distilled water. Nervous and emotional patients are more susceptible to the toxic action of cocain, and consequently it is advisable not to use cocain on such patients, or, if it be absolutely necessary, the administration should be carried on with the greatest possible precautions. The author advises the use of amyl nitrite to counteract the powerful vaso-constrictor action of cocain, and recommends the rules of administration advocated and practiced by Reclus.

[*Nordisk Tandläkare Tidskrift*, Stockholm, 1903.]

A CONTRIBUTION TO THE ETIOLOGY OF PATHOLOGIC CONDITIONS OF THE PULP IN APPARENTLY SOUND TEETH. BY DR. RAMBERG.

After considering the character of the pulp from a histological standpoint, and calling attention to the absence of collateral circulation and to the fact that the unyielding character of the tissues surrounding the root of the tooth increases the dangerous influence of inflammatory processes on the life of the pulp, Dr. Ramberg proceeds to relate the cases which particularly brought this subject to his at-

tention. Three sisters, between the ages of twenty and twenty-five, consulted the essayist at different times, complaining of pain in the anterior region of the lower jaw. All the anterior teeth were entirely free from caries. The history of the girls showed no constitutional trouble or local disease of any kind, except that one of them many years previously had suffered from an attack of diphtheria; no local injury or salivary calculi could be detected, and the articulation was perfect in both cases. The two central incisors were slightly discolored, and at the root of one of them a small fluctuating swelling was found. Diagnosis: Degeneration of pulp. Upon incising the gum a small amount of pus appeared. In drilling into the tooth the pulp was found converted into a fat, ill-smelling mass. The case yielded quickly to ordinary abscess treatment.

Dr. Ramberg states that no matter what a man's pet theory may be, he must at some time in his reasoning arrive at the conclusion that the gangrenous conditions of pulps must be caused by microbes, and that it is self-evident that their avenue of ingress to the pulp must have been through the blood, as that is the only avenue by which the pulp can be reached when the crown is not the seat of caries. The theory of bacterial invasion through the pericementum and dentin at the neck of a sound tooth he regards simply as "a curiosity."

The most interesting phase lies in the fact that the same teeth in the three sisters succumbed to the same trouble. That fact leads to the supposition that those particular teeth presented a favorable field for a microbic invasion, and it might be safely assumed, the author says, that inasmuch as those teeth are supplied by the terminal branches of the artery supplying the lower jaw, the pulps' lowered resistance to bacteria had been caused by faulty nutrition. This, then, leaves a disordered circulation as the primary cause for the cases referred to. J. E. HEYKE, D.D.S.

[*Dominion Dental Journal*, Toronto, November 1903.]

DEVITALIZATION OF PULP, REMOVAL, AND SUBSEQUENT TREATMENT. BY G. F. BELDEN.

The author states that when cases come to him in which it is necessary to destroy the pulp, whether it be a wholly live one or partially so, he first isolates the tooth with the rubber dam or with rolls of cotton, and then dries it with cotton and warm air. After this a cavity can be excavated with less pain

than when damp. If it be then very sensitive he uses a solution of carbolic acid and cocain crystals as a local anesthetic, dips a small pledget of cotton in the solution, places it in the cavity, leaves it *in situ* for a few minutes, and then proceeds to excavate, which can be done with a great deal of comfort to the patient and pleasure to the operator, as this solution will work wonders in a cavity of that nature. He then exposes a small point of the pulp, if possible without causing any bleeding, as the application works much better when blood is not present. He picks up a few fibers of cotton, rolls them into a small ball about the size of a pinhead, dips it in oil of cloves, and dries it a little by placing another pledget of cotton upon it. He does this in order to avoid the danger of the oil of cloves oozing out and carrying with it the arsenic. The cotton is then made to touch the arsenic, taking up the smallest amount possible. The cotton, with the arsenic, is placed directly on the point exposed, is covered up with a little more cotton, and is then sealed in with base-plate gutta-percha. Dr. Belden says that he uses this variety of gutta-percha because it can be more securely sealed in a cavity than the form usually employed for filling material.

The reviewer, while in accord with the author so far as the use of the arsenic and oil of cloves mixture is concerned, totally disagrees with him on the use of gutta-percha as a material for sealing-in arsenical applications, for the following reasons: (1) Because, in order to be reasonably sure that the gutta-percha filling will not be dislodged, the cavity must be of a retentive shape, a condition which it is not always possible to secure in teeth having exposed pulps. (2) Because, in order to make a tight filling with gutta-percha, it is necessary to use a certain degree of force and pressure, thus causing an unnecessary amount of pain. (3) Because it demands a great deal of time and labor to insert a gutta-percha filling that will adapt itself perfectly to the walls of the cavity. (4) Because, with even the use of a great deal of care and attention, a gutta-percha filling can never be made as tight as one of oxyphosphate or oxychlorid of zinc.

The reviewer always discourages the use of gutta-percha in any of its forms for the sealing-in of arsenical applications, and invariably recommends the use of zinc oxyphosphate, or perhaps better, of zinc oxychlorid, as this latter material can be removed from the cavity with a great deal less difficulty than can the zinc oxyphosphate.

The author then describes his method of removing the pulp, and states that if there be

but little or no irritation in the tooth, and the patient be in a healthy condition, he fills the root-canal at once. Before filling the root-canal he recommends wiping out the canal with oil of cloves, as he has found this agent to be a thorough disinfectant while not so irritating as many others, and also one which will not penetrate the tubuli of the tooth to such an extent as oil of cinnamon.

[*Items of Interest*, New York, December 1903.]

THE DRUG ASPECT OF LESIONS OF THE GUMS. BY A. W. HARLAN, CHICAGO, ILL.

Many, if not all, injuries of the gum will recover with little or no treatment if they be superficial, or if the cause of the injury be removed quickly, as by the cutting away of a protruding filling or the removal of any exciting cause of trouble between the teeth. A crown which is too long may cause serious trouble to the gums and to the sockets of teeth if not cut away; even a large filling that does not occlude properly may cause disturbances. Swelling of the gums, and even death of the pulp, has resulted from such conditions. There is usually no "drug aspect" of the gums in purely local injuries, unless we include the application of astringents, as zinc sulfate, lead-water, boric acid, or one of the naphthol series in saturated solution. Most of the local hemorrhages are controlled by hot water, ferripyrin, or adrenalin chlorid. Tannic acid and zinc acetate can also be used in such cases. When there is a suspicion of an infection from a local injury, mercuric bichlorid solution 1:1000 should be used. In the absence of all the above agents first cleanse the surface with hot salt water, and paint with carbolic acid 95 per cent., and give the patient four-grain doses of quinin bisulfate in one ounce of spirits every hour. In case of local infection of the gums or mucous membrane, it must be treated, first, by cleansing; second, by disinfecting by local application; and third, by the internal administration of a drug that will arrest sepsis, such as salol, iodine compounds, boric acid, mercury, or the coal-tar derivatives, such as the naphthol series.

The author then discusses the gingival manifestations of such general diseases as scrofula, syphilis, ptomain poisoning, fevers, and the exanthemata. The "drug aspect" of general diseases is limited to the local use of sprays, washes, and general cleansers. Boric acid, hydrogen dioxid, sublimate solutions, hydronaphthol solutions, silver compounds, iodine, zinc, copper, and strictly acid solutions, acetic, hydrochloric, trichloroacetic, etc., are

some of the agents that may be used in connection with these disturbances. The lesions of the gum requiring drugs are those proceeding from the apices of roots, the sides of roots, and the surfaces of the gums themselves. In the latter variety the treatment is very simple, and consists in cleansing the gums with hydrogen dioxid and painting them with the compound tincture of iodine, two or three coats, so as to get a new surface, and if the patient is fed on liquid or semi-liquid food for two or three days the gums will become clean and free from redness, irritation, or tendency to bleed.

The author then refers to lesions of the gums which proceed from the apex, stating that occasionally it is necessary to amputate the portion of necrosed root before the lesion will disappear. The author is a strong believer in keeping the gum margin intact, therefore does not favor the use of wooden tooth-picks, floss silk, or rubber bands. The gums must be scoured and washed and massaged daily to prevent tendency to bleed. If the teeth are sensitive to the air, or to the touch, magnesia, chalk, soda, or lime must be used to counteract this tendency.

The author recommends the following mouth-wash:

Hydro- or Beta-naphthol,	3j;
Menthol,	gr. ijss;
Oil of cinnamon or cassia,	
Oil of wintergreen,	āā ℥ v;
Glycerin,	
Alcohol,	āā 3iij;
Distilled water,	3x. M.

Sig.—Use as a mouth-wash, full strength.

In order that mouth-washes may do good, the mouth must be rinsed first with cool water. Then the wash should be introduced in a small quantity, one-half teaspoonful. The gums are rubbed again for one to two minutes, the wash being allowed to remain to be diluted with the saliva. Even with this care, however, the organisms as a rule are not all destroyed.

Dr. Harlan concludes his instructive paper by referring to the possibility of the Finsen ray for the arrest of pus-production. He has been using this ray in a limited number of cases, and believes that dentists will have less use for drugs in the so-called pyorrhea, after a year or two, than they have at present. The bactericidal effect of the ultra-violet ray is produced in something like four to five seconds in a full-field exposure by a Bang lamp, while the arc-light exposure requires about five minutes to destroy a culture of the staphylococcus pyogenes aureus. A slight

erythema, lasting for some days, may always be expected in the use of the ultra-violet ray. If it be brought in contact with hair follicles the hair will drop out; its influence on the nails causes them to become brittle, but in its employment in treatment of the gums these accidents are not likely to occur.

The author in concluding his paper states that he is convinced that the instruction usually given by the dentist to the patient is not sufficiently clear or impressive to do the good that might be accomplished; whenever a discharge from between the gum and tooth is found, the practitioner should make it an object lesson to the patient.

[*University of Pennsylvania Medical Bulletin*, Philadelphia, November 1903.]

SURGICAL TREATMENT OF FACIAL Palsy. BY DRs. CHAS. H. FRAZIER AND WM. G. SPILLER.

The authors state that by a number of observations both experimental and clinical it has been revealed that by grafting or uniting a partially degenerated to a normal nerve it is possible to produce regeneration in the affected nerve and to restore function to the muscles which it supplies. Ballance and Stewart, of England, joined the facial nerve to the spinal accessory for the relief of facial palsy. The second operation was performed by Faure, of France, in 1898. The operation was unsuccessful. The third operation recorded in the literature was performed in 1899 by Robert Kennedy, who divided the facial nerve for the relief of facial spasm, and established anastomosis with the spinal accessory. As a result of the operation, function was restored to both groups of muscles, although the movements of the facial muscles were not independent of those supplied by the spinal accessory. Since their first experience in 1895, Ballance and Stewart have operated upon six additional cases of chronic facial palsy. The facial was joined to the spinal accessory in all but one instance, in which the hypoglossal nerve was selected.

The essayist states that, generally speaking, the sooner the operation is done the better the prognosis, therefore, when the nerve is believed to be destroyed, operation should be performed without delay; but on the other hand, when there is some reasonable doubt as to the permanence and completeness of the lesion, delay is justifiable. If, in these doubtful cases, at the expiration of six months there are not the slightest signs of recovery, operation should be performed at once.

Inasmuch as this method of treating facial palsy has but recently been introduced to the medical profession, many inquiries have been made as to whether it holds out any hope to those who have had this disturbing deformity for years. To this question the authors reply by stating that the element of time is of less significance, as far as the nerve itself is concerned, and that the keynote to the whole situation is the condition of the muscles. If the facial muscles are completely atrophied and will no longer respond to galvanic stimulation, the prospects of restoration of function are extremely doubtful. Up to the present time, three years is the longest period at the expiration of which the function of the nerve has been properly restored.

The author gives a report of a case of facial paralysis produced by the severing of the facial nerve in its course through the petrous portion of the temporal bone, before it makes its exit through the stylo-mastoid foramen. Dr. Frazier performed an operation which consisted in anastomosing the hypoglossal nerve to the stump of the facial. He describes the technique of the operation, and says that as the facial nerve is a motor nerve, the surgeon should select as its anastomotic complement a motor nerve or a mixed nerve. Three nerves have been proposed—the spinal accessory, the hypoglossal, and the glossopharyngeal. The last nerve is not very suitable for this purpose, and the choice remains between the spinal accessory and the hypoglossal. In order to answer the question as to which should be preferred, the author states that due account must be taken of the results which have been reported in cases in which one or the other of these operations have been performed. Division of either will, of course, be followed by paralysis of the muscles which it supplies. In the case of the spinal accessory, there will be complete paralysis of the sterno-cleido-mastoid, and partial paralysis of the trapezius and drooping of the shoulder. In the case of the hypoglossal there will be paralysis of the depressors and of some of the elevators of the hyoid bone, with atrophy of one-half of the tongue. As compared with the deformity which it is hoped will be relieved, these disturbances may be considered as alike insignificant, and from this standpoint it matters little which nerve is sacrificed. After the facial nerve has been anastomosed to the spinal accessory, there follows an association of movements of the face and shoulder; that is to say, whenever there is an involuntary contraction of the muscles of the face, there is simultaneously a contraction of the muscles

of the shoulder and *vice versa*. This phenomenon—not necessarily a permanent one, although no case has been reported in which the shoulder and muscles could be innervated alone—is easily explained.

This interesting report is followed by remarks upon the treatment of facial palsy from the standpoint of the neurologist, by Dr. Spiller.

[*Revue Odontologique*, Paris, October 1903.]

SALIVARY CALCULI IN WHARTON'S DUCT AND IN THE SUBMAXILLARY GLAND. BY DR. JOUSSEAUME.

This variety of calculi is very rare, but the study of their symptomatology is interesting, presenting as it does so many and varied features. Dr. Joussemaume embodied in his thesis at the Faculty of Medicine of Bordeaux the result of his observations, which have already appeared in the *Journal de Médecine et de Chirurgie*. Many theories have been advanced to explain the formation of salivary calculi. Galippe has attributed it to an infection of the salivary ducts by micro-organisms. Sabrazes and Joussemaume, in the course of examinations, found only a very few microbes, and therefore were not able to confirm Galippe's theory. Calculi weighing under one gram are composed mainly of phosphate and carbonate of calcium and organic matter. When located in a salivary duct they produce dilatation of the tube and a chronic inflammation of the walls of the duct, which may eventually terminate in sclerosis and atrophy of the gland. In some instances the disease does not make itself apparent, and there are on record cases of patients who expelled calculi without any pain or inconvenience, while in other cases the pain appears spontaneously and is acute, piercing, and lancinating in character. In a different type of cases the disturbance manifests itself by the formation of a hard tumor on the floor of the mouth, and consequently deglutition becomes very painful. The acuteness of these symptoms, their sudden appearance, and characteristic evolution, as well as such concomitant general disturbances as loss of appetite, cerebral excitement, and nausea, constitute the symptomatology of the disease under consideration.

The painful phenomena vary in persistence and degree, and do not cease until the calculus is expelled. In the meanwhile the submaxillary gland becomes congested, ptyalism sets in, and the patient experiences piercing pain in the sub-hyoid region. When the calculus is spontaneously expelled it often happens

that its ragged and sharp edges lacerate and rupture the mucous membrane of the floor of the mouth, thus establishing an internal fistula. In another type of cases the calculus becomes incarcerated in the mucous membrane, through which it could not pass, and this accounts for the erroneous diagnosis often made, which disregards completely the original location of the calculus in the salivary duct. In some exceedingly rare instances the calculus finds its way externally through the skin. The formation of the fistula is preceded by inflammatory phenomena on the outside, and through the opening thus established there escape saliva, pus, and blood, and finally one or more calculi are expelled. The inflammatory phenomena in the duct sometimes spread internally toward the gland, and as micro-organisms find a suitable medium for development and growth in the retained saliva, they acquire a violent degree of virulence, which accounts for the formation of glandular abscesses sometimes observed in this variety of cases. The inflammation may also involve the tissues of the neck and cheek; the lymphatic ganglia become hypertrophied, the cellular tissues infiltrated and hard, the skin red and warm; edema is very pronounced in the mouth, and the size and extent of the swelling may be so large as to provoke suffocation; the tongue becomes swollen and shows deep imprints of the teeth, the borders of the tongue are edematous, and as the result of these phenomena the patient suffers from insomnia, thirst, and anorexia. All the foregoing symptoms may lead to an erroneous diagnosis, viz, the supposition that the growth is of cancerous nature. The diagnosis is, however, generally favorable.

The treatment is prophylactic and curative. To arrest microbial influence use the following mouth-wash:

R—Thymol,	gr. xv;
Oil of peppermint,	
Oil of aniseed,	
Oil of badiane, āā	3ss;
Tinct. of cochineal,	gr. xlv;
Alcohol,	3iv. M.

Sig.—Five to ten drops in a glass of hot boricated water.

The calculus should be removed through the duct, if possible, by crushing it and subsequently extracting the fragments. If the calculus be held tightly within the duct the pocket will have to be opened, although this is not advisable, as wounds of this kind heal with difficulty.

PERISCOPE.

To Remove Tin Foil Easily from a Vulcanite Plate.—Before flasking the case, soap the model, and when vulcanized the tin foil can be stripped from the plate with ease.—C. L. DAVIS, *Dental Summary*.

An Aid in Carrying Pumice.—When using felt cones or wheels in polishing rubber plates, gold crowns, etc., hold a piece of soap against the wet cone before applying the pumice. The soap on the cone prevents the development of too much heat and will also carry the pumice.—D. E. SHEEHAN, *Dental Summary*.

To Overcome the Tendency to Gagging when Inserting a Denture.—Dipping the plate into strong vinegar before inserting it in the patient's mouth will prevent any ordinary case of gagging. In extreme cases, bathe the roof of the mouth with a menthol solution applied on a pledget of cotton.—C. L. DAVIS, *Dental Summary*.

Effect of Formalin on the Skin.—The cuticle is killed; it hardens, cracks, and desquamates; in some individuals this is attended by an eczematous rash. The nerve terminals in the skin are paralyzed, producing an annoying numbness. Where the skin is cracked the entrance of formalin becomes very painful.—W. H. DALL, *Science*.

Isolate Teeth when Setting Inlays.—Don't set an inlay without putting on the rubber dam wherever it is possible to do so. Always have pressure, either by wedge or ligature, and leave thirty minutes before removing dam; cement-setting under pressure gives best results and prevents expansion making a noticeable joint.—W. T. REEVES, *Dental Summary*.

To Burnish Backing over the Edges of Teeth.—In backing up facings for bridges and crowns with heavy plate, especially canines, it is sometimes hard to burnish the backing over the incisive edge. To facilitate matters split the backing in several places parallel with the long axis of the tooth to the line where the plate is to bend. It will then burnish over easily. Go over this surface once with a file, and it will hug the tooth perfectly.—D. E. SHEEHAN, *Dental Summary*.

Impaired Vision Caused by Empyema of the Ethmoidal and Sphenoidal Sinuses.—Impaired vision is not as often met with in maxillary sinus suppuration as it is in disease of the ethmoidal and sphenoidal cavities; orbital complications, however, may also occasionally accompany maxillary sinus disease, and the cause not be suspected.—PERCY R. HOWE, *Internat. Dental Journal*.

Method of Relieving Sensitive Dentin.—In the case of cervical cavities, which are always very sensitive, I use a local anesthetic hypodermically, exactly as for extracting. Put on dam and dry thoroughly, touch with carbolic acid followed by warm water. Use sharp burs and run engine fast. The adjusting clamp cannot be felt, no matter how far below the gum the cavity extends.—I. B. KENNEY, *Dental Summary*.

Lupus.—Bowker reports seven cases of lupus successfully treated by the injection of Koch's lymph and arsenic, combined with the thorough extirpation of the diseased tissue. If the wound left after extirpation is extensive, small skin-grafts will be found of great service in promoting healing. All the cases quoted had been previously unsuccessfully treated by scraping or burning.—*New York Med. Journal*.

Treatment of Infected Wounds.—Never omit the ordinary aseptic and antiseptic precautions because a wound is already infected, or because you are operating in an open cavity. In the first instance you may bring about a mixed infection, and in the second it is well known that open cavities can take care of a moderate number of bacteria only, and that the cleaner they are kept the better they will do it.—*Internat. Journ. of Surgery*.

About Grinding Inlays.—Don't grind an inlay after it is set, on any surface other than the grinding surface in the case of inlays for molars and bicuspid, and the cutting edges of inlays for the incisor teeth. All grinding that is necessary should be done before the matrix is removed and the inlays should then be reglazed in the furnace. The glazed surface of porcelain is a protection to adjoining tooth-surfaces.—W. T. REEVES, *Dental Summary*.

Treatment of the Incisal Edge of Porcelain Facings.—It is essential that the incisal edges of facings be ground in such a manner that the least possible amount of gold is exposed which is consistent with strength of the bridge and proper protection to the porcelain facings. This is done by beveling the linguo-incisal edge of the facings to form obtuse angles with the plane of the lingual surfaces of the facings.—J. Q. BYRAM, *Dental Summary*.

Cavity Lining: Its Advantages.—The use of a suitable insulating material will prove the advantages of cavity linings, to seal the tubuli and cover the dentin with a non-irritating and non-conducting material that cuts off electrical action between filling and dentin, and prevents escharotic action of the zinc cements upon the pulp; prevents recurrent decay and the penetration of moisture, thus preserving the tooth's translucency when it is necessary to insert a material that discolors; gives longer service of the filling, and also comfort from thermal shock, and prevents the need of cutting away the tooth-structure for extension.—*Western Dental Journal*.

Capping Pulp in Young Patients.—I can conceive of only one condition where we are justified in capping the pulp, and that is in the mouth of a young patient where we suspect the root has not been fully developed. In such a case it is our plain duty to attempt to preserve this organ if only for a year; but the operation and its object should be explained to the parent or guardian with the instruction that the patient return at once in case of subsequent trouble. In older patients I do not think it good practice to try and save the pulp where caries has penetrated deeply, especially if the tooth has ached for any great length of time.—J. P. BUCKLEY, *Amer. Dental Journal*.

Right and Left Eyes.—Unless you happen to be the one person out of every fifteen who has eyes of equal strength, you are either left-eyed or right-eyed. You also belong to the small minority of one out of every ten persons if your left eye is stronger than your right. As a rule, just as people are right-handed, they are right-eyed. This is probably due to the generally greater use of the organs of the right side of the body, as, for example, a gunner using his right arm and shoulder uses his right eye, thereby strengthening it with exercise. Old sea-captains, after long use of the telescope, find their right eye much stronger than the left. This law is confirmed by the experience of aurists. If a person who

has ears of equal hearing power has cause to use one ear more than the other for a long period, the ear brought into requisition is found to be much strengthened, and the ear which is not used loses.—*Health*.

A Point on Cavity Preparation for Porcelain Inlays.—The first fundamental requisite for inlay work is that the cavity must ordinarily be more widely extended on the surface of the tooth than for fillings. In other words, the orifice of the cavity should be well opened out. This with some cavities involves the cutting away of much sound tooth-tissue, but unless the operator has the courage to do this he will have little use for inlays in such cavities, for instance, as proximo-occlusal cavities in bicusps and molars, or in fact in any cavity involving two or more surfaces.—C. N. JOHNSON, *Dental Summary*.

Treatment of Putrescent Pulp in Deciduous Teeth.—The method of the writer in deciduous teeth with putrescent pulps is, first, the removal of all debris from the canals as far as possible without cutting through the enamel, and inserting a small pledget of cotton saturated with Black's "1, 2, 3," and filling the cavity with oxyphosphate or pink gutta-percha if the cavity be not too large. This gutta-percha may be added to from time to time as it wears down, and the comfort of the little patient is maintained and mastication is assured.—G. E. ADAMS, *Internat. Dental Journal*.

Testing the Contour of Gold Fillings by Means of the Mechanical Separator.—In the insertion of gold fillings the application of the instrument should be gentle at first, then slightly increased from time to time as the filling progresses, to the full extension of the contact point and final finish of the same. Then the separator may be employed as a test. Removing the force, allowing the teeth to fall together, one may judge in a few moments, by using the floss silk, whether the contour is too full, or just right. If the former, the screw is turned on again and a little more removed with thin, fine, oiled cuttlefish strips. The perfect point of contact cannot, as we know, always be determined at once. Days afterward, it may be, the discovery will be made by the patient or the operator that the floss cannot be passed at all. The separator can be placed, without the dam, and the tape again passed. How much better this method than the oft-used scratching saw, or the file which invariably cuts away too much, leaving the latter condition worse than the first.—GARRETT NEWKIRK, *Dental Summary*.

The Woman Dental Assistant.—The employment of a woman assistant cannot be too strongly recommended, and she should be taught to do everything that it is possible to delegate to her. The dentist who administers a general anesthetic is likely to subject himself and his patient to great embarrassment if he does not have a woman assistant present during such administration. He may even find it extremely difficult to controvert the suggestion that may have come to the mind of his patient while under the influence of the anesthetic, and may thus be held under suspicion of that of which he is entirely innocent. Since the condition of the mind has much to do with the physical condition, the dentist should protect himself from those petty annoyances which will occur unless guarded against.—F. MILTON SMITH, *Internat. Dental Journal*.

Surgical Treatment of Trigeminal Neuralgia.—Baroni says that surgical treatment of trigeminal neuralgia must be regarded as a last resort after analgesics, antipyrin, quinin valerianate, bromids, opium (in the form of pills), the continuous electric current, injections of osmic acid or strychnin, etc., have failed. He reports two cases of trigeminal neuralgia in which he employed resection of a portion of the nerve, instead of removal of the Gasserian ganglion, and in view of the brilliant results possible with the less dangerous operation recommends that it be first employed in all cases requiring surgical treatment. The technique is briefly as follows: Under morphin and cocain anesthesia a vertical incision is made through the masseteric region, avoiding the facial nerve fibers, reaching the ramus of the jaw, and trephining through it until the dental branch is reached. The latter is then extracted in the usual way. If the pain be distributed along other branches they are extracted in the same way, after being reached through appropriate incisions. Thus, in the second case, the auriculo-temporal branch was extracted, after making an incision in front of the ear, exposing the temporal artery, and following it until the nerve was isolated.—*New York Med. Journal*.

A Method of Banding and Setting Logan Crowns.—After preparing the root for your crown, take thin platinum, thirty-four or thirty-six gage, and burnish it over the stump, or make it in the form of a cap, making a water-tight joint; then make a hole through the cap and thrust the pin through it, leaving your crown in place; place a point of pure gold upon the union of the cap and the pin, put it in the furnace for five minutes and

flow the solder, then take it out; if you desire, place it in the mouth—being sure that the joint is still water-tight—and you will have an absolute joint which has been procured in very little time. You then flow between the cap and the roughly ground crown the porcelain body, and in another ten minutes you will have that porcelain body making the union between the platinum cap and the crown. You will then have a Logan crown adjusted absolutely, and in less time than you usually take in grinding an approximately perfect joint. I do not care whether the periphery of the stump or that of the crown is or is not exactly the same, because the difference can be filled out by the body, and it seems to me an ideal way in which to place a Logan crown.—J. D. PATTERSON, *Western Dental Journal*.

Rheumatism: Its Micrococcus.—The writers formulate the following provisional statement: The *Micrococcus rheumaticus* produces formic acid in very considerable quantity, and also at least one other acid of the fatty acid series. The acid (formic) is not only present in the filtered cultures of the organism, but can also be extracted from the bodies of the micro-organisms themselves. The washed micrococci contain, in addition to formic acid, at least one of the higher fatty acids. Ordinary streptococci, such as streptococci isolated from a case of erysipelas, only give rise to a small amount of formic acid. This observation may constitute a means of differentiation between the rheumatic micro-organism and other members of the streptococci group. Formic acid, and probably another fatty acid, are present in the urine during the course of acute rheumatism in appreciable amounts. From normal urine formic acid is either altogether absent or occurs in traces only. Under the salicylic acid treatment of rheumatism formic acid is reduced in quantity in the urine of the patient. Formic acid is obtainable from the tissues of an animal (rabbit) suffering from acute arthritis due to the inoculation of the micro-organism.—E. W. A. WALKER and J. H. TYFFEL, *Brit. Med. Journal*.

Occasional Toxic Effects of Boric Acid and Borax.—In view of the recent experiments in the Department of Agriculture with food preservatives, particular interest attaches to the occasional toxic effects of chemicals used in the preservation of articles of food. Certain observations of Von Noorden's (*Therap. der Gegenwart* for February; *Centralbl. für innere Med.*, October 31) show that at times the use of a mouth-wash of a 3.5 per cent.

solution of boric acid may give rise to stomatitis, characterized by swelling of the lips, the gums, and the border of the tongue, salivation, tenderness, and now and then superficial ulcerations. These phenomena occur only in certain individuals. Kister (*Zeitsch'ft für Hygiene u. Infektionskrankh.*, xxxvii; *Centralbl. für innere Med.*, October 31), having experimented on fowls, dogs, cats, rabbits, and guinea-pigs, concludes that the use of boric acid as a preservative is apt to be injurious. Dosquet-Manasse (*Therap. der Gegenwart* for August; *Centralbl. für innere Med.*, October 31) relates the case of a strong man who, for a throat-affection, was ordered to inhale the spray of a solution of a teaspoonful of borax in a pint of water. Unpleasant symptoms appeared every time the spray was applied. That they were not due to the mere effect of spray as such was shown by their non-occurrence when the spray of a decoction of camomile was used.—*New York Medical Journal*.

Coffee as an Antiseptic.—As long ago as the beginning of the eighteenth century the virtue of coffee in time of plague was noted, and the opinion expressed that, had it been known in England in 1665 it would have been found "of excellent use." A hundred years later attention was drawn to the deodorizing power of roast coffee, and its use was recommended to counteract bad smells of various sorts. In recent years, however, various scientific investigations have been made to define the degree of its bactericidal powers, and to discover which of the constituents of coffee possesses them. Luderitz in 1889 showed that anthrax bacilli were killed by three hours' exposure to a ten per cent. infusion of coffee, and cholera bacilli by four hours' exposure. Quite recently, Drs. Crane and Friedlander of Cincinnati have tried the preservative effects of ground coffee on various quickly decomposing substances. When mixed with egg yolk and white in the proportion of one to two, absolutely no putrefaction took place, although the substance was freely exposed to laboratory air throughout a hot summer. Chopped beef mixed with coffee also remained many months without the slightest sign of decomposition. It is not easy to decide to what constituent these properties of coffee are due, since green coffee is in no way antiseptic, nor has caffeine any antiseptic qualities. The most likely hypothesis is that during the process of roasting coffee tannic acid gives rise to certain bodies resembling the phenols, but this is not yet established.—*Med. Press and Circular*.

Anesthesia by Interrupting Conductivity of Nerves.—Solutions of cocain and allied substances can be used by perineural or endoneural injection to interrupt the conductivity of nerves. An excellent local anesthesia is thus brought about. Endoneural injections are generally possible only after the nerve-trunks have been dissected out with infiltration anesthesia; this would prolong the operation quite extensively for amputations, but in inguinal hernias, varicose veins, and operations on the anterior aspect of the neck, the time lost is generally slight. For perineural injections, concentrated solutions are necessary unless adrenalin be added (one to two drops of the commercial solution to every cubic centimeter of one per cent. cocain solution), or unless the extremities are tied off. In mixed nerves the motor, and often the vaso-motor nerves, are paralyzed as well. An accurate knowledge of the nerve-distribution is absolutely necessary. For superficial nerves a one-half of one per cent. eucain solution with adrenalin seems to be best. It may take up to thirty minutes before anesthesia appears; it generally lasts two to five hours.

Enderlen saw a fatal result after six cubic centimeters (one and one-half drams) of a one per cent. cocain solution with six drops of adrenalin. Trying it upon himself he obtained absolutely no effect. Perthes could perform many operations upon fingers and toes, extraction of teeth, tendoplasty, etc., successfully without after-effects.—*BRAUN, Medical News*.

Forces Leading to the Formation of the V-shaped Palatal Arch.—Körner and Waldow claim that adenoids are often responsible for the deformity of the superior maxillary, viz, the V-shaped palatal arch; Gleitsman, however, differs, claiming that there can be no deformity of the hard palate due to adenoids and mouth-breathing. I am sure that breathing through the mouth, due to a stenosis of the nasal passage, can cause an ill-developed superior maxillary bone, especially if the adenoids are present before the child begins to erupt the deciduous teeth; after the teeth are once erupted the development of the adenoids will not, I believe, have as marked a tendency to cause a deformity of the superior maxilla as when the adenoids are present very early in life, because after the teeth are once erupted it is more difficult for a change to take place in the position of the superior or inferior maxillary bones than it is before. It stands to reason that if the person is breathing through the mouth, and the mouth is kept continually open, the weight of the lips

and the traction of the muscles of the malar and labial regions of the face will cause the superior maxillary bone to become narrow. A very small amount of pressure on any soft bone will completely change its normal shape. If a child after six years of age starts attending school, and sits on a bench so high that the feet cannot touch the floor, and the limbs hang over the edge of the seat, the weight of the feet will cause a curvature in the femur. If that six-year-old child's limbs can have a curvature thus induced marked enough to cause a deformity, when he is in the schoolroom only four or five hours a day and is up and running around the rest of the time, why should not the contraction of the orbicularis oris and the weight of the muscles and tissues on the superior maxillary bone cause this bone to change its normal form?—CASSIUS C. ROGERS, *Amer. Dental Journal*.

Cancer of Lips.—An excellent series of articles upon epithelioma of the lips and tongue appears in the *Practitioner*, and in one of these T. Stoker shows that cancer of the lips has been gradually increasing in frequency during the last decade. He does not believe that heredity is at all an important factor in etiology, but lays a great deal of stress upon the use of the clay pipe so common among the poorer classes of Ireland, where this affection is most frequent. This disease is rare among non-smokers. Furthermore, the cancer usually appears on the side on which the pipe is held, and in one very unusual instance of cancer in the middle of the lip it was found that it was the habit of the patient to hold the pipe in the center of his mouth. It is doubtful if syphilis is of any importance as a predisposing cause. The great bulk of cases are in persons over fifty years of age. It is practically never seen in persons under thirty. The freedom of women from cancer of the lip is notable, but this depends, undoubtedly, not upon the sex, but upon the habit of smoking, which is so rare among them. The upper classes are also comparatively free from the disease, a fact which is explainable by their greater care of the teeth and mouth, but especially because they use a pipe—if they smoke one at all—not made of clay. The clinical course is tolerably definite, spreading to the lymphatic glands below the jaw and later down the neck. The salivary glands are not affected till late and it is very unusual for the tongue to become cancerous secondary to the lip. In fact, metastatic growths may be looked upon as unknown, death from exhaustion, septic disease of the lungs, or hemorrhage, preceding their

possibility. The only two conditions to be confused with epithelioma in diagnosis are sarcoma and syphilis. The former, if seen early, will be found to have commenced in the substance of the cheek. It is a rare condition. If the history and examination does not make a case of syphilis clear, a short course of mercury will be conclusive. The only justifiable treatment is thorough excision as early as possible. Since, however, the only secondary manifestations till rather late in the disease are found in the glands of the neck, one should not despair too early, even when the disease has become extensive. Operations have been done for recurrences several times with ultimate success.—*Medical News*.

The Uses of Swiss Broaches.—The Swiss broach is an invention from the watchmaker's art which has become almost a necessity in root-canal treatment. These broaches, as sold by the jewelers' finders, consist of a handle, or thumb-shank, like that on the ordinary barbed broach, and a foil-like polygonal blade, tapering to a fine point. The broaches vary in size, from extremely fine to comparatively thick. They may be purchased of very hard temper and of very soft temper. The latter renders the broach useless except for barbing, and the former makes it so exceedingly brittle as to render it useless as purchased. The high temper may be very readily reduced, however, by placing a few broaches in a test-tube, and holding the latter over a flame, allowing the flame to impinge upon the part of the tube over which the shanks of the broaches lie. As the correct heat is approached, the blade of the instrument will change to a straw color, then to a bright hue. This change will appear first near the shank, and if the tube be moved slowly the color will creep along the blade until the extreme tip is tempered. The broach may then be thrown out to cool on anything that will not burn. The operation may be done with a simple broach over a tiny flame, or near the flame of a match, but the results are much inferior, as a rule. This tempering changes the broach from a useless article to one which may be tied in a knot without breaking, but may be used to penetrate a canal, offering some resistance without the maddening result of bending upon itself into a crumpled mass of useless steel. In the selection of the broaches, only those having a distinct taper to the blade should be bought, as those with blades of even diameter throughout are very liable to bend.

The uses of these little instruments are varied. As explorers for fine points of exposure, as explorers of canal apertures for

the determination of the size and direction of the canal they are very useful, and may be filed to an extreme thinness to enable them to enter the finer canals. As reamers of canals they also do admirable work. Successive sizes, beginning with the finest, are passed into the canal and rotated with the fingers. Acids tend to injure these instruments, so that they may break, but this does not occur, as a rule, unless undue force be used. As carriers of cotton for the swabbing out of canals for any object they are indispensable, though of course an analogous instrument may be constructed by filing the fine truncated end of a Donaldson bristle to a polygonal form. Their value in this direction lies in their smooth taper and unround form, which permits the cotton to be quickly rolled upon them, and, when charged with the canal contents, to be removed. The cotton is readily removed without soiling the fingers by grasping the broach with the finger and thumb of the left hand at a point near the shank and back of the loose fibers of cotton; the shank is held with the thumb and finger of the right hand, and with a quick pull the cotton is slipped off the broach as a neat cone.—OTTO E. INGLIS, *Stomatologist*.

Local Anesthesia by Oberst's Method.—

J. W. Struthers (*Edinburgh Med. Journal*, August 1903) gives his experience of this method. This method applies chiefly to the fingers and toes, the circulation of which is arrested by a tourniquet and an injection of cocain (one per cent.) made round the nerves. This differs from Schleich's infiltration method, which consists in infiltrating the operating area itself with a very dilute solution of cocain without arresting the circulation. The one method may be said to be the complement of the other, for infiltration cannot be used on fingers and toes, while Oberst's method is practically limited to the digits and adjoining parts. Soft rubber tubing does well as a tourniquet. Five to ten minims of a one per cent. solution of cocain are injected round each digital nerve beyond the tourniquet. After ten minutes the finger is anesthetized, and may be amputated painlessly. Anesthesia lasts as long as the tourniquet is left on, and for some minutes after removal. When the base of the finger is to be operated on, the tourniquet may be applied to the wrist.

This method has been employed in fifty cases recently at the Leith Hospital. In more than forty of these the tourniquet was applied at the base of the finger or toe, and in several cases two or three fingers of one hand were

treated simultaneously. The majority of cases were severe wounds, in all cases requiring thorough cleansing, and in many cases removal of nails, skin, or parts of fingers. Others were whitlows, warts, etc. In all cases complete anesthesia was produced. In two cases disagreeable after-effects were noted: in one, severe pain a few hours after operation, in the other, loss of sensitivity for a few weeks. These effects were due to the tourniquet being too tight. In no case was there cocain intoxication. In six cases the circulation was arrested at the wrist and the cocain injected in the palmar and dorsal aspects of the hand in the lines of the nerves. Four of the patients were men, one a girl of ten, and one a boy of ten. Two of the men had wounds and two had septic conditions. In three of the men complete anesthesia was obtained; in the fourth—a stout, alcoholic subject—the injections had no effect. The girl and boy were operated on for severe wounds of the fingers and for tuberculous dactylitis respectively. Both were successful after thorough operation. In these cases the tourniquet was applied above the elbow. In two of these the pressure caused severe pain. In the third case the cocain was injected round the ulnar nerve at the elbow, but the anesthesia was only partial. In one case the method was applied to the penis for circumcision. The tourniquet was applied behind the glans, and cocain injected in the lines of the dorsal nerves, and on each side below. Anesthesia was complete.

Struthers concludes that this method may be used for the majority of finger amputations, if not for all. Whitlows and wounds can be treated more thoroughly, and the operator can work single-handed. The question arises whether the method can be applied to larger portions of the limbs. The author's experience is against applying the tourniquet above the wrist, and the application of a tourniquet high up on the arm or leg is so painful as to contra-indicate its use in any but exceptional cases, or where general anesthesia is considered dangerous. The question of the relative influence of the cocain and the tourniquet in inducing anesthesia has been debated. The combination of the two produces a more perfect and longer anesthesia than either used alone. The tourniquet prevents the absorption of the cocain into the general circulation and thus prolongs its local action. Eucaïn may be used instead of cocain, and is said to be less toxic. Cocain undergoes chemical change if kept long in solution, hence a fresh solution should be used for each case.—C. F. M., *Treatment*.

HINTS, QUERIES, AND COMMENTS.

POST-EXTRACTION PAIN.

PAIN following the extraction of teeth, while comparatively a rare occurrence, is, however, in some cases of such a severe nature as to require immediate surgical and therapeutic interference on the part of the dentist. Post-operative pain of this character appears in some cases shortly after the performance of the operation, while in others it does not become manifest until several days after extraction. In the majority of cases the pain is caused by inflammatory phenomena the result of infection of the alveolus subsequent to the extraction, or by the retention of the pyogenic sac in the case of teeth the seat of alveolar abscess. The onset of the attack in this type of cases does not occur until one or more days after the extraction.

But, as is well known, the nerve supply of the pericementum arises both from the common trunk which penetrates the tooth through the apical foramen, and also from the gum, and when the tooth is extracted the severing of these nerve filaments gives rise to pain, which eventually may become very acute by reason of an undue degree of pressure upon these filaments caused by the coagulation of the blood against the sides and apex of the alveolus.

In cases where the bony region, especially around a lower tooth, has increased in density as the result of inflammatory processes, its extraction will be probably followed by a certain degree of pain, as a greater amount of physical force will be required to dislodge the tooth, and the almost unavoidable straining and perhaps laceration of the soft tissues will excite in the gingival mucous membrane a state of inflammation which very often spreads, involving part or all of the floor of the mouth and perhaps the buccal or lingual mucous membrane, according to the location of the tooth or teeth that were extracted.

Pain involving a considerable area is often the result of perineuritis of microbic origin, and in this case is observed almost exclusively about the lower jaw.

The *treatment* of pain following the extraction of teeth is exceedingly simple, and is generally followed by very satisfactory results. The first step should consist in thoroughly curetting the alveolus, thus removing all disorganized tissue, coagulated blood, and alveolar débris, if any be present. The alveolus is then copiously irrigated with warm water, and after drying it with cotton an application is made of tincture of calendula. The alveolus is then loosely packed with sterilized gauze. If by the next day the pain has not subsided, a new application of tincture of calendula should be made. At times the gauze will stick lightly to the walls of the alveolus; if such should be the case it should be wetted with warm water before any attempt at removal is made.

Campho-phénique, phénol-sodique, and solutions of silver nitrate, chromic acid, sulfuric acid, and zinc chlorid may be used as substitutes for tincture of calendula, but the writer gives the preference to this agent, as it has the power of subduing inflammatory states and in addition the property of stimulating the growth of healthy granulations. It has also been recommended to cauterize the apex of the alveolus with the thermo- or electro-cautery, or with one drop of carbolic acid; Dr. Kirk, who advocates the latter plan, has several cases on record thus treated successfully. In cases of diffused pain over a considerable area the internal administration of sodium salicylate in conjunction with the local treatment will produce good results.

JULIO ENDELMAN.

A NEW WORD ON "TAKING THE BITE."

IN writing on the subject of a "bite," I realize that the first question in the minds of most dentists will be, What now can be said on that worn-out subject?

I know the process of taking a bite did not originate in my office; so far as I am aware, however, the method I here present is original. It consists simply in causing the patient to

manipulate the tongue in such a manner as to get the mind completely off from the process of biting.

Prepare the wax and base-plate in the usual manner. Instruct the patient to apply the tongue to the roof of the mouth as far back as possible. Allow him to do this several times, opening and closing the mouth, before you insert the wax, and explain to him the great importance of keeping his tongue in that particular spot. Place the bite material in position and again give instructions regarding the patient's part in the process. Now tell him to bite into the wax, cautioning him frequently to keep the tongue in the correct position.

The above applies in case of "squash" bite or when the bite for a lower plate is being taken. In taking the bite for the upper plate or for upper and lower, using the base-plate method, I instruct the patient to place the tongue on the extreme heel of the plate in-

stead of in the roof of the mouth, and explain the absolute necessity of holding it tightly against the palate.

With the tongue in this position, and the patient's mind on the tongue, it is practically impossible for the lower jaw to be thrown forward or laterally out of the correct relation with the upper.

Another advantage of this method is in taking a bite for the edentulous lower jaw. The tongue is out of the way and does not interfere with or move the lower base-plate, and the operator may feel sure that the plate is resting correctly while the bite is being taken.

I have used this idea for the last two years with entire success, and am sure those who may try the method will be equally successful, providing they sufficiently impress patients with the importance of keeping the tongue in position.

R. E. LUTHER.

OBITUARY.

DR. J. FOSTER FLAGG.

DIED, at his residence, Swarthmore, Pa., on the evening of November 25, 1903, J. FOSTER FLAGG, D.D.S., after a long and painful illness, in his seventy-sixth year.

Dr. Josiah Foster Flagg, the only son of Dr. John Foster Brewster Flagg and Miss Mary Waterman Jackson, was born at Providence, R. I., October 15, 1828. He was a grandson of Josiah Flagg, the first native-born American dentist, and was the last male descendant of that branch of the Flagg family. The family history dates back to Thomas Flagg, supposed to be a native of Ireland, who arrived at Watertown, Mass., in 1642.

It was through his great grandfather, Lieut.-Colonel Josiah Flagg, that the family became so closely identified with the rise and progress of dental science in America. Josiah Flagg, then a lad of about eighteen years, was a private in the Elliott regiment, of which his father was an officer, when the American and French troops were encamped in winter quarters near Providence, R. I., 1781-82. The war

was practically over, and Joseph Lemaire, a surgeon-dentist from Paris serving as a surgeon with the French contingent, resumed the practice of his profession. He and Lieut.-Colonel Flagg became intimate, and the opportunity thus offered for his son to learn this new profession from so skilful a master was promptly embraced. Young Flagg proved an apt student, and achieved a fair measure of success. His eldest son, Josiah Foster Flagg, born 1789, was educated for the medical profession, but on the death of his father entered upon dental practice.

In 1797 Josiah Flagg married as his second wife Miss Eliza Brewster, a direct descendant of the sixth generation from Elder Brewster who came over in the Mayflower as leader of the first contingent of the Pilgrim Fathers—thus uniting these two old colonial families. Dr. Flagg's father, J. F. B. Flagg, was the only son of this marriage. His father dying in 1816, when he was only twelve years of age, his education was directed by his elder brother, who exercised over him a fatherly

care, and in due time taught him the art and science of dental surgery. On reaching manhood he moved to Providence, R. I., and shortly after married Miss Mary Waterman Jackson, daughter of a prominent citizen of that town. Dr. J. Foster Flagg was their only son.

His early education was received at the Providence schools, and later at a school in Boston conducted by Bronson Alcott. In 1842 his father removed to Philadelphia, and soon became intimate with the more prominent Philadelphia dentists, and was an important factor in inaugurating the movement which resulted in making Philadelphia an important dental educational center. On leaving school young Flagg entered the Jefferson Medical College of Philadelphia, but on account of being under age did not graduate. About 1849 the California gold excitement electrified the country; he had not as yet "settled down," and with a desire to see the world he immediately set out for the far distant gold-fields, taking with him an assortment of dental and medical instruments and drugs.

The excitement appealed to his active, ardent nature, and in due time he arrived at the expected "Eldorado." While here he had varied and exciting experiences. At one time at the gold diggings, again as a cowboy on the plains, and later engaged in the first attempt to impound the waters of the mountain streams for use in mining and irrigation, he and his co-laborers laid the foundation of that which has done so much to develop the industries of that region. It might well be called a "wild life," but J. Foster Flagg knew how to take care of himself; his home training was not forgotten; and his surroundings developed in him a manliness, mentally and physically, that served him well in later years. In camp he was a leader; there was that about him that commanded respect while inviting comradeship; and now and again his well-trained muscles were called upon to administer to the rougher element convincing arguments that he was not to be trifled with.

The dental and medical knowledge acquired before leaving home now came into use, and he soon became a much-sought physician, surgeon, and dentist, in treating the diseases and accidents of camp life. The dreaded Asiatic cholera played sad havoc in many camps. On its approach Dr. Flagg instituted

strict sanitary precautions, and as a prophylactic urged the free use of acids, with the result that the disease did not prevail where these precautions were observed. For treatment he advocated giving the sufferers all the water they cared to drink, well dosed with acid, opium only when needed for relief from pain, and stimulants when the severity of the attack was over. This treatment was not quite "orthodox," but as his patients usually recovered, it seemed to him "good enough." Pickles were among the camp luxuries, and the surplus vinegar was at times the only obtainable acid. It proved very efficient, and was carefully hoarded, being considered, at times, "worth its weight in gold."

The methods of gold mining then practiced required an abundance of water. The supply from the mountain streams was very irregular—at times deficient, and at other times destructive in its abundance. Dr. Flagg with a few others conceived the idea of impounding these streams so as to secure a more reliable supply. While at work solving the engineering problems involved in building a dam to store up water for mining and agricultural purposes, word reached him that his mother was seriously ill and had a yearning to see once more her only son. His filial love overcame his ambition, and he promptly decided to start for home at once.

This proved a very great financial loss. While he and his partners were well satisfied that their work would prove successful and in the end profitable, and had embarked their all in the enterprise, it was generally distrusted and considered a wild scheme. While the desirability of impounding and holding for a time of need the surplus water of the rainy season was fully recognized, its practicability was doubted, and it was prophesied that the first freshet would wipe out all their labor. This made it difficult for him to sell out his interest to advantage. Having then spent nearly seven years, and withal feeling home-sick, he had decided to leave the Pacific coast for good, and therefore desired to close out all business interests, and to so do was compelled to accept for his share in the enterprise less than he had put into it, and very much less than it was worth, as the sequel proved. His engineering plans proved successful; he had well studied the forces the dam would encounter, and so well planned

to resist them that it withstood many freshets, and as a venture was profitable beyond expectation; enlarged and improved, it remains in use to this day.

His next care was the home voyage. He was informed that a vessel was all ready to sail from San Francisco but waited to obtain a competent medical officer, and it was suggested to him that his medical experience and reputation in camp might obtain him the position. He applied, his application being indorsed by some of his friends. The examination was brief. "Can you treat cholera?" "I can," was the prompt and emphatic answer. It was enough. He was engaged for the voyage and given his passage for his services, with orders to provide as quickly as possible an ample medical chest at the company's expense. So frequently and so fatally had the dread disease appeared on former voyages that no vessel would sail without a physician. The position was not sought after, and this vessel had waited days to supply this need when Dr. Flagg applied.

In relating the incident he confessed that the situation was embarrassing. He had no fear of cholera, unless he himself should be the victim, and he inwardly prayed that there should be no other diseases, and but little of that. It was his only chance to get home quickly. The passenger list was full, and no other vessel was expected to sail for a month. Furthermore, the free passage well suited his finances. He promptly directed and enforced such proper sanitary precautions as were possible in an overcrowded passenger ship, and was the one man in all that ship's company whose orders were willingly accepted and promptly executed. These proved efficient. That vessel was one of very few sailing about that time from San Francisco to Panama which, on arriving at its destination was able to report "no serious sickness and no deaths."

Once more at home the question of his life's vocation was seriously considered. He finally decided to adopt his father's profession, and entering the Philadelphia College of Dental Surgery he was graduated from that institution at its fourth annual commencement, February 29, 1856, in the same class with his distinguished colleague and brother-in-law, the late Prof. James E. Garretson.

For a few years he practiced in New Jersey, but returned to Philadelphia in 1860, and

located with his father at 1112 Arch street. Fortuitous circumstances assisted him to quickly acquire a satisfactory practice. His genial manners, his professional skill, and his gentleness in operating gave him a firm hold upon his patients. Among these was a large number of school-children whose gratitude he earned by refusing to make appointments with them on Saturday. He contended it was their holiday, and should not be broken into even for an hour; the care of their teeth was fully as important as their education, and should be done in other time than their own.

Dr. J. Foster Flagg entered the dental profession determined to succeed; he was energetic, enthusiastic, and a tireless worker. He possessed in full measure the true professional spirit, and held, and taught, and practiced, that every man's interests were best served when each tried to help the other. He promptly became a contributor to periodical dental literature, addressing himself more particularly to those problems usually termed "practical," those which immediately concern a dentist's daily work. His first contribution was upon the construction of artificial teeth (*Dental News-Letter* for October 1856, vol. x, p. 209), dealing with the artistic arrangement, and referring to points he had observed to be frequently overlooked.

He was a keen observer, quick to appreciate the relation of cause and effect, and resourceful in overcoming the many difficulties constantly taxing the abilities of a dental practitioner. He mingled freely with fellow practitioners, ever ready to learn or to impart, and took an active part in solving the professional problems of the day. He *knew* what he *did know*, and expressed his convictions with positiveness and confidence, making, however, no pretensions regarding matters of which he was not sure; "I don't know" was with him a frequent expression when conversing upon professional matters. "I think," "It may be so; I don't understand it," "That is out of my line," etc., was his usual comment upon unsolved problems; but regarding those which he felt had been solved, his emphatic "I know" admitted of no question and tolerated no doubt. There was in this no egotism; it indicated absolute confidence, nothing more. While holding in profound respect the conclusions of others, especially those which had become crystallized

into accepted theories and generally considered safe guides in dental practice, he did not permit them to override or obscure his own observations. He was ever open to new ideas, to consider new theories and new methods upon their intrinsic merits rather than the reputation of their authors. His judgment on these was usually quickly rendered, and generally accurate.

Dr. Flagg began his career as a teacher by accepting the chair of "institutes of dentistry" in the first faculty of the Philadelphia Dental College at its organization in the spring of 1863, and he outlived all his colleagues. The title of this chair was changed at the beginning of the sixth session, 1868-69, to that of "dental pathology and therapeutics"—a change of name only. He resigned at the close of the seventh session in order to devote his time more fully to private practice, continuing however his connection with the college as clinical instructor. With the opening of the seventeenth session, 1879-80, he resumed his old position, and continued to lecture until the close of the session of 1895-96, when he finally retired. During this period the Philadelphia Dental College made a decided advance. About 1887 it united with the Medico-Chirurgical College in the erection of a new building for joint occupancy in order to secure more room and more convenient arrangement to accommodate their constantly increasing classes. Dr. Flagg had much to do with designing the new structure, and skilfully planned the various class and clinic rooms to secure the largest capacity without sacrifice of comfort and convenience. During the erection he superintended the details of construction, meeting and solving the many problems that arose as the work progressed. For this he was eminently qualified; he knew what was needed, and his mechanical ingenuity suggested novel expedients adding much to the usefulness of the finished structure, which proved, when finished, well adapted to its intended use.

As a teacher he displayed marked ability. He had a personal magnetism that attracted and retained the student's attention; he was earnest, enthusiastic, spoke with energy and emphasis, and interspersed in his remarks witty sayings and anecdotes so appropriate and well told that they served to firmly fix

the facts presented in the minds of his hearers. His lectures were not desultory reading of text-books; on the contrary, they were original, well-connected, and interesting discourses and recitals of personal experiences having a direct bearing upon the vocation with which the students were most concerned. His hints and suggestions embodying that which he had learned during his long practice, so freely mingled with the more prosy teachings of the text-books, were of great value to his students in after life, and were much appreciated.

Wherever possible he enforced the spoken word by demonstrating before his class, and constructed for this purpose many ingenious models; among them an enlarged model of the mouth and jaws with the teeth and tongue in position. This proved an admirable arrangement for illustrating positions to be assumed in operating, arranging napkins, bandages, etc., and the most convenient way of performing various dental operations. This was duplicated and patented in England, as something new, more than a score of years after Dr. Flagg had introduced it to his classes.

He had the happy faculty of making himself one with his students without sacrificing the dignity of a teacher. He was approachable, invited their friendship, made their interests his, and was fond of speaking of them as "my boys."

As a writer Dr. Flagg contributed to dental periodical literature all through his professional life. He wrote as he spoke—with emphasis and vigor. His style was quite original and while it at times lacked scholarly dignity, it conveyed unerringly the writer's thoughts. He was inclined to be epigrammatic, while wit and sarcasm, pointed yet so refined as to be thoroughly enjoyed even by those who felt its shafts, flowed freely from his pen. His most notable production is his work on "Plastics," a work that merits a place in all dental libraries.

Dr. Flagg can hardly be considered a dental society man. He could not forget that his father and uncle were compelled to forego membership in the American Association of Dental Surgeons for no other fault than that of declining to sign away the right of using their own judgment in matters of practice. He noted with keen regret that the professional societies held, with all the ten-

acity of religious bigots to the accepted tenets of the day. As he once remarked to the writer, he seemed to have been born a professional heretic, and from first to last of his professional career he was the subject of adverse criticism, and at times of reproach. He bore it all, however, in good part, and lived to see many of his derided ideas accepted and adopted, and would now and again remark, as he noted in society discussions the once-denounced suggestions advanced as good practice, "They are getting up to me; they will be there after a while." Yet, notwithstanding, he keenly regretted the spirit of intolerance so frequently displayed in dental societies, and regarded it, as all thoughtful men must do, as a hindrance to real progress. While he frequently attended dental society meetings, thoroughly enjoyed them and took an active part whenever present, and felt, and knew, that his remarks were enjoyed and appreciated, he felt more free as a visitor than as a member. That a man remains placid, and replies playfully to adverse criticism does not imply that he enjoys it. Dr. Flagg did not. He held his membership in dental societies every ready to "slip his moorings" to escape expulsion, fearing that he might transgress some part of the creed—a part that perhaps the society itself might shortly after expunge.

Early in his career as a dentist Dr. Flagg was impressed with the importance of saving all of the natural teeth that could by any possible means be kept useful and comfortable. He appreciated the difficulties attending the manipulation of gold in teeth badly broken down, and observed that the much-decried amalgam seemed to be especially useful in such cases. The expression so frequently used as that time, "Any tooth worth saving should be filled with gold," did not appeal to him as a good motto for a dentist who wished to do the best for his patient. To him it seemed more reasonable that any tooth that could be made comfortable, and was useful, was worth saving, and he realized that this included many teeth that could not be filled with gold by even the most expert operators.

The so-called "amalgam war" had just closed; notwithstanding that, however, the leading lights of the dental profession were not converted; they still believed that amalgam was vile stuff to place in carious human

teeth, and had not yet learned that many of the ills credited to it were due to improper or imperfect treatment of the tooth preparatory to inserting the filling. Dr. Flagg's father and uncle, while bitterly denouncing amalgam, quite as bitterly denounced the American Association for provoking the controversy, holding that it had no right to impose restrictions upon its members in their efforts to benefit their patients.

Dr. Flagg had been taught to avoid amalgam, many of his professional associates were opposed to it, and he naturally had a prejudice against it. He had not been long in practice, however, when he became convinced that in many cases it was the only available means of prolonging the usefulness of teeth important to the comfort of their owners. He resolved that inasmuch as he alone was responsible for the results of his operations and that this responsibility could not be shared by those who assumed to dictate what was and what was not in accordance with professional probity, he would be guided in all such matters by his own experience and judgment.

Laying aside as far as possible preconceived notions, he addressed himself to the problem of tooth-saving. He was thus led to look upon amalgam as a good thing to use when nothing better was available. He carefully noted its many defects, and by a long series of careful observations and experiments sought their elimination. Conducted as this research was, progress was necessarily slow; it was, however, sure. He first noted the differing behavior of amalgam made of various alloys and endeavored to ascertain the part played by their several components. From his professional associates he selected a number whom he knew to be skilful, unprejudiced, careful observers—men in whose judgment he had confidence, and whose fields of labor were widely separated—to test the various alloys he experimentally compounded, asking from them reports of their behavior as fillings, after an interval of several years. They were requested to carefully prepare a record of the position, surroundings, and circumstances attending the insertion of each filling, and to place them as far as possible where they could be frequently seen, and their condition noted. Especial attention was asked regarding tooth-saving, integrity, and color. Dr. Flagg kept

a record of the formula of these alloys, and full particulars of the treatment they received before they left his hands.

When reports from these came back to him after an interval of some years, he was able to collate the experience of many observers, working under varied conditions, and to know far more than could possibly have been learned by laboratory experiments alone. In many cases reports were, after a longer interval, revised. An alloy that was pronounced satisfactory after two years' observation might be condemned a few years later. After years of such experimentation he began to learn the varied properties of the available metals and how these properties were modified by alloying, and to select and properly proportion them to produce a desired result. When this point was reached, about 1881, he published the first edition of his work entitled "Plastics and Plastic Fillings." In this work he embodied the results of his labors to date, and by subsequent editions and corrections kept the profession fully informed of the progress made. None but those close to Dr. Flagg can appreciate the vast labor these researches, continued more than two score of years, involved; the care with which they were conducted, or how cautiously the results were from time to time announced. Now and again he announced to his friends, "I have done with it; I have not reached the end, but I have done all I can; let someone else finish it." He continued, however, his efforts to improve this class of fillings until the very end of his long and useful life. In his last interview with the writer, but a few months before his death, he said that he had just completed some experiments by which he *thought* he had obtained an amalgam that preserved its color better, and a gutta-percha better able to withstand wear; as soon as he was satisfied with the tests then in progress he intended the profession to have the benefit of it. That was his last effort. He died in harness.

As an unlooked-for outcome of these researches the profession was startled about a quarter of a century ago by a boldly announced "New Departure." While making these researches upon amalgam, Dr. Flagg noted that amalgam seemed to have tooth-preservative properties apart from those due to its plasticity. Upon examining further in

this direction he observed that in mouths where gold fillings were apt to prove temporary only, decay quickly recurring around the filling or at its cervical margin, amalgam often proved more lasting and more effective in arresting decay. He further noted that a class of teeth universally termed "soft"—teeth that seemed prone to decay, and in which gold fillings required frequent renewal, teeth that dentists in general consider as doomed to be early lost—did far better when filled with amalgam. He still further observed that in recurring decay, if the new decay were removed and the defect repaired with amalgam the operation was usually more nearly permanent than when the defective filling was removed and replaced with gold, or when the repair was made with gold. These results were unlooked for, and were inexplicable by any theory then in vogue with the dental profession. It had been before observed that tin was in some cases a better decay-arrester than gold, and that gutta-percha was equally effective, if not more so. At first this was explained by the softness of tin and gutta-percha permitting a better adaptation to the cavity walls, but later and more searching observations established that these two tooth-filling materials seemed to be effective in cases where it was known that the cavity adaptation was imperfect, while gold often failed in spite of the best adaptation an expert operator was able to make, and in fillings that seemed excellent.

About this time the late Dr. Stewart B. Palmer, of Syracuse, N. Y., and the late Dr. Henry S. Chase, of St. Louis, Mo. (DENTAL COSMOS, 1876, vol. xviii, pp. 244, 352), both of whom were in correspondence and were working with Dr. Flagg in these investigations, suggested the electro-chemical theory as an explanation. They, indeed, contended that under certain conditions at times present in the oral cavity a filling in a tooth becomes a galvanic battery whose energy depends upon the relation, electrically, between the substance of the tooth and the material of the filling. The farther they are apart, potentially, the more energetic this battery becomes. The result of this electric energy, they contended, was a changed condition of that portion of the oral fluids immediately at the junction of the tooth and the filling by which they became acid and tooth-destroying. Inas-

much as gold and the substance of the tooth (for convenience in this discussion termed "dentos") are widely separated on the electro-potential scale, while dentos, tin, amalgam, the cements, and gutta-percha are in the order named closely related, this was presented as an explanation of the mystery. Dr. Flagg made no pretension to knowledge of these intricate matters. The explanation was plausible. He therefore called to his aid scientists well qualified to investigate the matter, and was by them informed that the theory was in accord with recognized principles of electro-chemistry.

These three investigators were now convinced that the failure of gold fillings was not due to defective manipulation, nor yet to an inherent weakness of the teeth themselves, as had heretofore been so strenuously held. Manipulative ability had failed to make gold the tooth-saver the dentist needed in so many cases, and they felt that it was high time to take a "new departure" by abandoning this cure-all and using in its place something else for those teeth in which it had so signally failed.

The real question was not "gold or plastics." They admitted that there was nothing better than gold for all cases where it effectively arrested decay, but contended that its continued use in places where general experience taught that it was *not* effective was not good practice. As was well known, so little are some teeth prone to decay that any kind of filling will effectively arrest their destruction, while on the other hand the best efforts of an expert fail to do more than retard it in others. The first class need but little help; the second, all the help dental science can give them. Hence the first article of the so-called New Departure creed: "In proportion as teeth need saving, gold is the worst material to use"—the worst material because by its presence, to a greater degree than does any other tooth-filling material, it brings about a local condition favorable to tooth-destruction. That was the theory of the New Departure.

Dr. Flagg made a forceful presentation of the subject in an address delivered at a special meeting of the New York Odontological Society, November 20 and 21, 1877. He was well qualified for the task. He felt he was right, and spoke with earnestness and energy. He

well knew that the views expressed would encounter a strong opposition, and invite to himself and his colleagues adverse criticism. His purpose was a laudable one. It was to get the profession out of a rut, a slavish following of the old maxim that gold was the only filling material a respectable dentist should use, and to elevate from the realms of quackery the much-abused yet useful plastics. Notwithstanding the tempest his address aroused, it accomplished its purpose, and stimulated a series of improvements in all these plastic fillings that has given them a wider field and increased usefulness. For this the profession owes Dr. Flagg a debt of gratitude.

The value of Dr. Flagg's services in introducing improved formulas for dental alloys, and new methods of making and preparing them for use; in advocating the use of the non-metallic plastics and acting as their champion on their advent into respectable dental practice in this country, will be more and more appreciated as time goes on. The profession may disregard the theories of the New Departure, but there is, nevertheless, an unmistakable tendency toward the practice he advocated, and a growing recognition that it tends to greater success in tooth-saving. Dr. Flagg had good grounds for now and again facetiously remarking. "They are getting there; they will be up to me after a while."

What an honored place do the three generations of this family occupy in the annals of dentistry in America! The grandfather, the pioneer native-born American dentist; his two sons, distinguished alike as practitioners, teachers, and investigators, who have made the way easier for those who follow; while the grandson's earnest efforts to increase the usefulness of the profession promise to revolutionize the practice of the science. With the death of Josiah Foster Flagg the chapter ends.

On October 31, 1861, he married Miss Mary Craft, who survives him.

By prudent living and good business management during his active life, Dr. Flagg was able to retire when advancing years made professional duties a burden. At his comfortable and pleasantly situated country home at Swarthmore, with congenial neighbors, his children and grandchildren close at hand, re-

lieved from all care, he enjoyed for a few years a well-earned rest. He was not, however, idle. He continued to manufacture the plastic filling materials he had done so much to improve, and continued his experiments looking to a still further elimination of their defects, until the inroads of disease compelled him to relinquish his investigations.

He leaves two daughters, Mary, the wife of Dr. James Price of Swarthmore, and Lillie, the wife of Professor Gummere, of Ursinus College, Collegeville, Pa.

His remains were interred in Woodlands Cemetery, Philadelphia, on Saturday, November 28th. WM. H. TRUEMAN.

A Testimony to Dr. Flagg.

TO THE EDITOR OF THE DENTAL COSMOS:

Dear Sir,—No doubt the COSMOS will contain an appropriate tribute to the *professional* character and life-work of our departed friend, Dr. J. Foster Flagg. With your kind permission I should like to add my humble testimony to the character of the man.

It was my privilege to be a student at the Philadelphia Dental College in 1864-65, where I learned more practical dentistry from Dr. Flagg than from any other source. A strong affinity sprang up between us, and from that time we became intimate friends.

Seventeen years ago I had to give up work by reason of sight failure, and in my anxiety for the future it was my dear friend Flagg who came to my aid with a generous proposal as to business relations. These have resulted in mutual pleasure and advantage, so that we have been drawn very closely together, coming to know each other remarkably well.

I can truly say I never met with a more genial and generous soul. His letters, always brimming over with humor and loving-kindness, have been like a perennial stream of comfort, encouragement, and joy. He was indeed a "brother born for adversity." His goodness to me no words can convey. I know also there are many who could indorse this brief testimony to the unselfish and entirely benevolent nature of the best friend I ever knew.

Yours very truly,

W. H. WATTE.

ROCK FERRY, CHESHIRE, ENG.,

December 8, 1903.

MR. WILLIAM ASH.

DIED, November 19, 1903, at Tower House, Camden road, N. W., London, Eng., Mr. WILLIAM ASH, in his eighty-fifth year.

We regret to announce that Mr. William Ash, the youngest son of Claudius Ash the founder of the firm of Claudius Ash & Sons, died at his London residence on Thursday, November 19, 1903. Born in the parish of St. James, Westminster, April 18, 1819, he was educated in London, and in due course joined his father and his brothers George Claudius and Edward in business. For nearly sixty years Mr. William Ash was a familiar figure at Broad street, and all who remember him will recall his kindly and urbane manner. He ceased to take an active part in the business about ten years ago.

In addition to the business side of his life, Mr. William Ash was deeply interested in the dental profession and was very closely associated with the Dental Hospital of London from its inception. For a great many years he was an active member of the committee of that institution, and took a prominent part in its removal from Soho square to Leicester square, the result of a proposal by Sir Edwin Saunders. At the annual general meeting of the governors of the hospital in 1873, Mr. Ash proposed an alternative to the Saunders plan. "His idea was to build suitable premises, rather than to convert old ones into the nearest approach to convenience they would allow. At considerable trouble he had procured plans and drawings in connection with sites to be obtained from the Metropolitan Board of Works, on which a hospital could be erected, adapted in all points to the requirements of the managing and medical staff, the students, and also the Odontological Society. . . . His proposal was discussed, but eventually the decision was given in favor of the original plan." (Hill's "History of the Reform Movement in the Dental Profession in Great Britain," page 237.)

Soon after his twenty-first birthday Mr. William Ash married Sarah, the daughter of Mr. James Matchwick of Guilford, Surrey, who predeceased him by only sixteen days. Three years ago a stained glass window was inserted in the church at Heathfield, Sussex, in which parish Mr. Ash had a country residence, as a thankoffering and in commemoration of his diamond jubilee.

Mr. William Ash leaves three sons and three daughters. Of the sons, William Henry and Claudius James are at present the senior directors of the firm of Claudius Ash & Sons, Limited.

The funeral took place on Monday, November 23, at Highgate Cemetery, and was largely attended by members, relatives, and friends of the family, also by many of the employees at Broad street and some from the factory at Kentish Town.

DR. ANGELO C. LEWIS.

DR. A. C. LEWIS died at his home, No. 42 Mariner street, Buffalo, N. Y., October 18, 1903.

Dr. Lewis had not been in good health for several months, but did not become seriously ill until three days before he died.

Angelo Corello Lewis was born in Burlington, Vt., on February 18, 1847. His parents brought him to Buffalo when he was a few months old, and he had lived there ever since. In 1863, when he was sixteen years old, he enlisted in the navy and served three years during the Civil War. He served on several vessels, including the Shenandoah, the Hetzel, the Savannah, and the Constellation.

After the war he entered the old Buffalo Medical College. He began the practice of dentistry in partnership with his brother, Dr. Theodore G. Lewis. About eighteen years ago the partnership was dissolved and Dr. A. C. Lewis opened an office of his own. While practicing his profession he also gave some attention to military matters. He was a member of the 65th Regiment and for several years was captain of Company I, being for a time the senior captain of the regiment.

In 1887 he accepted the superintendency of the state arsenal on Broadway, a position that he held for ten years, retiring from it about six years ago. In October 1894 a handsome gold medal was presented to him by the regimental officers for long and faithful service. He was a sharpshooter and received several medals for his prowess.

When he took the position of superintendent of the arsenal, Dr. Lewis continued his dental practice for a time, but by degrees gave it up, until he finally abandoned it entirely. Upon his retirement from the superintendency he accepted a responsible position with the Larkin Soap Company, which he held up to the time of his death. In that position he fre-

quently was entrusted with the taking of from \$30,000 to \$40,000 a day to the bank.

Having lived in Buffalo practically all his life and being of a genial disposition, he had a host of friends. He was a home man, devoted to his family. He was, for a time, captain of old Company D, Buffalo City Guard. He was also a member of T. A. Budd Post, Naval Veterans' Association, and of Revere Council, Royal Arcanum.

Dr. Lewis leaves a widow and four children, Arthur A. Lewis, Olga M. Lewis, G. Shirley Lewis, and Carlton J. Lewis. Two brothers also survive him, Dr. Theodore G. Lewis and James V. Lewis.

"IN MEMORIAM" RESOLUTIONS.

Dr. Jonathan Taft.

THE New York Odontological Society—at a recent meeting—adopted the following resolutions of regret upon the death of Dr. Taft:

Whereas, By the death of Dr. Jonathan Taft the dental profession loses one of its most representative members, and one of its most earnest workers.

RESOLVED, That, as a man of high ideals, as shown by his exemplary career, he carried his principles into his daily work, and never faltered in his efforts to elevate and advance the status of dentistry.

Having been connected with dental educational institutions as professor or dean since 1854, he knew the needs and weaknesses of the growing profession of which he was such an able representative, and through his teachings and writings his influence has been felt.

Beloved and respected alike by students and practitioners wherever he was known, he leaves a noble record. The profession to which he has unselfishly devoted so many years of his life is better for his having lived, and now that his work is done we mourn his loss, and tender our sincere sympathy to Dr. Taft's family in their bereavement. Also

RESOLVED, That this minute be spread in full upon the records of this society, and that a copy be sent to Dr. Taft's family and also to the dental journals.

WM. JARVIE,
A. L. NORTROP,
W. D. TRACY,
Committee.

MRS. HELEN STOCKTON HAINES.

DIED, December 11, 1903, HELEN STOCKTON HAINES, eldest daughter of the late Dr. Samuel Stockton White.

SOCIETY NOTES AND ANNOUNCEMENTS.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization Dental Congress.

H. J. BURKHART, Chairman.

E. C. KIRK, Secretary.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARE,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen.
- IV. Hygiene, Prophylaxis, Therapeutics, Materia Medica, and Electrotherapeutics. Chairman, A. H. Peck.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown.
- VI. Orthodontia. Chairman, E. H. Angle.

VII. Operative Dentistry. Chairman, C. N. Johnson.

VIII. Prosthesis. Chairman, C. R. Turner.

IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy.

X. Legislation. Chairman, Wm. Carr.

COMMITTEES.

Following are the committees appointed:

Finance. Chairman, C. S. Butler.

Program. Chairman, A. H. Peck.

Exhibits. Chairman, D. M. Gallie.

Transportation. (To be appointed.)

Reception. Chairman, B. Holly Smith.

Registration. Chairman, B. L. Thorpe.

Printing and Publication. Chairman, W. E. Boardman.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey.

Dental Legislation. Chairman, Wm. Carr.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel.

Membership. Chairman, J. D. Patterson.

Educational Methods. Chairman, T. W. Brophy.

Oral Surgery. Chairman, G. V. I. Brown.

Prosthetic Dentistry. Chairman, C. R. Turner.

Local Committee of Arrangements and Reception. Chairman, Wm. Conrad.

Essays. Chairman, Wilbur F. Litch.

History of Dentistry. Chairman, Wm. H. Trueman.

Nomenclature. Chairman, A. H. Thompson.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnelly.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.

Prize Essays. Chairman, James Truman.

Oral Hygiene, Prophylaxis, Materia Medica, Therapeutics, and Electrotherapeutics. Chairman, A. H. Peck.

Operative Dentistry. Chairman, C. N. Johnson.

Resolutions. Chairman, J. Y. Crawford.

Clinics. Chairman, C. E. Bentley.

Nominations. (To be appointed.)

Ad interim. Chairman, G. V. I. Brown.

The officers of the Congress, president, vice-presidents, secretary, and treasurer, will be elected by the Congress at large at the time of the meeting, and will be nominated by the Nominating Committee.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.

DAVID R. FRANCIS, *President of Exposition*.

Fourth International Dental Congress.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

J. A. LIBBEY, *Chairman*,
524 Penn Avenue, Pittsburg, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing membership as prescribed by the Committee on Membership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of dentistry*. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state chairman, whose indorsement is a certification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the Committee earnestly appeals to each eligible practitioner in the United States who is interested in the suc-

cess of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are as follows:

General Chairman—J. A. LIBBEY, 524 Penn Ave., Pittsburg, Pa.

States.

Alabama. H. CLAY HASSELL, Tuscaloosa.
Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.

California. H. P. CARLTON, Crocker Bldg., San Francisco.

Colorado. H. A. FYNN, 500 California Bldg., Denver.

Connecticut. HENRY McMANUS, 92 Pratt St., Hartford.

Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.

District of Columbia. W. N. COGAN, The Sherman, Washington.

Florida. W. G. MASON, Tampa.

Georgia. H. H. JOHNSON, Macon.

Idaho. J. B. BURNS, Payette.

Illinois. F. H. ZINN, 100 State St., Chicago.

Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.

Iowa. W. R. CLACK, Clear Lake.

Kansas. G. A. ESTERLY, Lawrence.

Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.

Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.

Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.

Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.

Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.

Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.

Missouri. J. W. HULL, Altman Bldg., Kansas City.

Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.

New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.

New York. B. C. NASH, 142 W. 78th St., New York City.

North Carolina. C. L. ALEXANDER, Charlotte.

Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.

Oklahoma. T. P. BRINGHURST, Shawnee.

Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.

Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.

South Carolina. J. T. CALVERT, Spartanburg.

Tennessee. J. P. GRAY, Berry Block, Nashville.

Texas. J. G. FIFE, Dallas.

Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.

Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.

West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.

Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.

For the Committee of Organization,

EDWARD C. KIRK, *Secretary*.

ODONTOLOGICAL PRESS CLUB OF SCANDINAVIA.

At a meeting held in Gothenburg, August 12, 1903, the Odontological Press Club of Scandinavia was organized. The object of the club is to facilitate acquaintanceship among its members and unite their efforts, and to advance the standard of the odontological press of Scandinavia.

Members are divided into two classes—active and corresponding. An active member must belong to the editorial staff of a scientific dental journal. A practicing dentist whose literary contributions to professional periodicals have been of such a nature as to secure for him the necessary two-thirds vote of the club may become a corresponding member, enjoying all the rights of active members except that of voting.

A yearly publication containing a complete register of dental publications in Scandinavia will be issued and sent free to every dentist in the Scandinavian countries—Sweden, Norway, and Denmark.

J. HEYKE, D.D.S.

A GOLDEN ANNIVERSARY CELEBRATION.

CLASS OF 1854, PHILADELPHIA COLLEGE OF DENTAL SURGERY.

THE dental profession of Philadelphia, represented by all of its organizations, will celebrate on February 27, 1904, the fiftieth anniversary of the graduation of the Class of 1854 of the Philadelphia College of Dental Surgery by a complimentary banquet to the surviving members of the class, consisting of Drs. LOUIS JACK, JAMES TRUMAN, C. NEWLIN PEIRCE, W. STORER HOW, and ERI W. HAINES.

All dentists in good standing are invited to participate. The subscription price, including a banquet ticket and one copy of the souvenir historical volume to be published in commemoration of the event, has been fixed at ten dollars. The subscription list will be open until February 10, 1904.

The committee in charge of the celebration consists of the following members:

EDWIN T. DARBY,	G. L. S. JAMESON,
EDWARD C. KIRK,	J. D. THOMAS,
R. H. D. SWING,	WILBUR F. LITCH,
ALBERT N. GAYLORD,	H. C. REGISTER,
EARL C. RICE,	WM. H. TRUEMAN,
I. N. BROOMELL,	ROBERT HUEY,
J. T. LIPPINCOTT,	WM. L. J. GRIFFIN,
L. FOSTER JACK,	J. CLARENCE SALVAS,
	D. N. MCQUILLEN.

Applications together with the subscription may be forwarded to the chairman of the Invitation Committee,

ROBERT HUEY, D.D.S.,
330 So. Fifteenth st., Philadelphia.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

THE fifty-seventh annual meeting of the Pennsylvania Association of Dental Surgeons was held at the Continental Hotel, Philadelphia, on Tuesday evening, October 10, 1903. After the reading and discussion of papers the following officers were elected for the ensuing year: Wilbur F. Litch, president; M. I. Schamberg, vice-president; J. Clarence Salvas, secretary; Wm. H. Trueman, treasurer and librarian.

J. CLARENCE SALVAS, *Sec'y.*

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH.

THE next regular meeting of the Southern Branch of the National Dental Association will be held in Washington, D. C., February 23, 24, and 25, 1904.

This meeting will be of unusual interest and one which you cannot afford to miss. Washington is a most interesting city and an ideal place of meeting.

CARROLL H. FRINK, *Cor. Sec'y N. D. A. So. Br.*
Fernandina, Fla.

NEW HAVEN DENTAL ASSOCIATION.

AT the annual meeting of the New Haven Dental Association the following officers were elected: F. W. Brown, president; E. S. Gaylord, vice-president; E. Frank Cory, secretary; H. A. Spang, treasurer. Executive Committee—J. Tenney Barker (chairman), A. F. Slater, F. C. Parsons. Finance Committee—E. S. Thompson (chairman), H. S. Nichols, G. E. Nettleton.

The association will hold a convention in New Haven during March, the date for which will be announced in the next issue of the COSMOS.

E. FRANK CORY, *Sec'y.*

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE sixth annual meeting of the Southern California Dental Association was held in the Dental College at Los Angeles on September 28 and 29, 1903. The meeting was devoted mostly to clinics, and it was the largest as well as the best meeting ever held in Southern California.

The association has an active membership of one hundred and seventy, of whom one hundred and thirty were present at the meeting. Forty-three new members joined.

The following were elected officers for the ensuing year: Lewis E. Ford, Los Angeles, president; Emma T. Reed, San Diego, first vice-president; P. R. Reynolds, Santa Anna, second vice-president; W. H. Spinks, Los Angeles, treasurer; Chas. M. Benbrook, Los Angeles, secretary.

The annual meeting in 1904 will be held in San Diego, Cal.

CHAS. M. BENBROOK, *Sec'y,*
455 So. Broadway, Los Angeles.

AMERICAN SOCIETY OF ORTHODONTISTS.

THE third annual meeting of the American Society of Orthodontists will be held December 31, 1903, and January 1 and 2, 1904, at the Hotel Iroquois, Buffalo, N. Y. A most interesting program has been prepared (see Cosmos for December).

ANNA HOPKINS, *Sec'y*, St. Louis, Mo.

OHIO STATE DENTAL SOCIETY.

At the thirty-eighth annual meeting of the Ohio State Dental Society the following officers were elected: J. F. Stephan, Cleveland, president; W. T. McLean, Cincinnati, first vice-president; H. L. Ambler, Cleveland, second vice-president; S. D. Ruggles, Portsmouth, secretary; C. I. Keely, Hamilton, treasurer.

S. D. RUGGLES, *Sec'y*.

NORTHERN INDIANA DENTAL SOCIETY.

At the fifteenth annual meeting of the Northern Indiana Dental Society, held at Wabash, September 15 and 16, 1903, the following officers were elected to serve for the ensuing year:

S. B. Hartman, Ft. Wayne, president; J. A. Stoeckley, South Bend, vice-president; Otto U. King, Huntington, secretary and treasurer; L. A. Salisbury, Crown Point, supervisor of clinics.

To serve with the above officers as members of the executive committee: A. H. Wagner, Huntington; M. Wilson, Rochester; C. E. Redmon, Peru; J. W. Stage, Goshen; M. W. Strauss, Huntington.

OTTO U. KING, *Sec'y*,
Huntington, Ind.

EASTERN DENTAL SOCIETY OF NEW YORK CITY.

On Thursday, December 3, 1903, the Eastern Dental Society closed the year's work by listening to the reports of its committees.

Very gratifying from an ethical standpoint is the success achieved by the society in obtaining voluntary consent to the removal of

certain advertising displays that were an eyesore on the lower east side.

A few papers were read by prominent dental practitioners, which, together with the general discussions upon related incidents in office practice conducted at the regular monthly meetings by members of the society, have greatly helped them in keeping up with the great strides that dentistry is making.

The following officers were elected for the year 1904: J. E. Carlin, president; M. H. Oser, vice-president; Joseph Sookne, secretary; Elias Gluskin, treasurer.

The next meeting will be held January 7, 1904.

JOS. SOOKNE, *Sec'y*.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting of the New York State Dental Society will be held at Albany, May 13 and 14, 1904. A full program will appear later.

R. H. HOFHEINZ, *Pres.*, Rochester, N. Y.
W. A. WHITE, *Sec'y*, Phelps, N. Y.

CLASS '91, NEW YORK COL- LEGE OF DENTISTRY.

REUNION.

A REUNION of the above class will be held in New York, on January 30, 1904. A large representation at the dinner is desired, and letters to be read are requested from all members unable to attend.

For particulars communicate immediately with either of the undersigned.

W. H. McCUTCHEON, Crescent Club,
W. D. PROVOST, 352 Stuyvesant Ave.,
Brooklyn.

ALUMNI ASSOCIATION OF NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

THE annual clinic of the Alumni Association of Northwestern University Dental School will be held January 19, 1904, at the university building, corner of Dearborn and Lake streets, Chicago.

All members of the profession are cordially invited to attend.

E. B. JACOBS, *President*,
G. B. MACFARLANE, 70 State st., *Sec'y*.

NEW JERSEY BOARD OF REGISTRATION.

INTERCHANGE OF LICENSE.

THE National Board of Examiners, at its meeting at Asheville, N. C., last August, passed the following resolution:

"RESOLVED, That an interchange of license to practice dentistry be, and is hereby recommended to be, granted by the various state boards, on the following specific conditions:

"Any dentist who has been in legal practice for five years or more, and is a reputable dentist of good moral character, and who is desirous of making a change of residence into another state, may apply to the examining board of the state in which he resides, for a new certificate which shall attest to his moral character and professional attainments, and said certificate, if granted, shall be deposited with the examining board of the state in which he proposes to reside, and the said board, in exchange therefor, may grant him a license to practice dentistry."

It is important that every state board take up the matter at once, and if possible place it by adoption upon their minute book, and be then prepared to act in this important matter

of interchange of license should application be made.

The State Board of New Jersey has adopted the plan, and it is understood that Indiana and Ohio also have acted favorably upon it.

The New Jersey Board will be pleased to take this up with you and enter into a mutual understanding and reciprocity in this matter.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

WISCONSIN BOARD OF DENTAL EXAMINERS.

THE next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates desiring license to practice dentistry in Wisconsin will be held in Milwaukee, at Hotel Pfister, January 25, 1904.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry consecutively for four years, or have been an apprentice to a dentist engaged in the reputable practice of dentistry for five years.

J. J. WRIGHT, *Sec'y*,
1218 Wells Bldg., Milwaukee, Wis.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING NOVEMBER 1903.

November 3.

- No. 743,294, to VERNON KNOWLES. Anesthetic apparatus.
No. 743,409, to GEORGE H. HURD. Apparatus for administering anesthetics.

November 10.

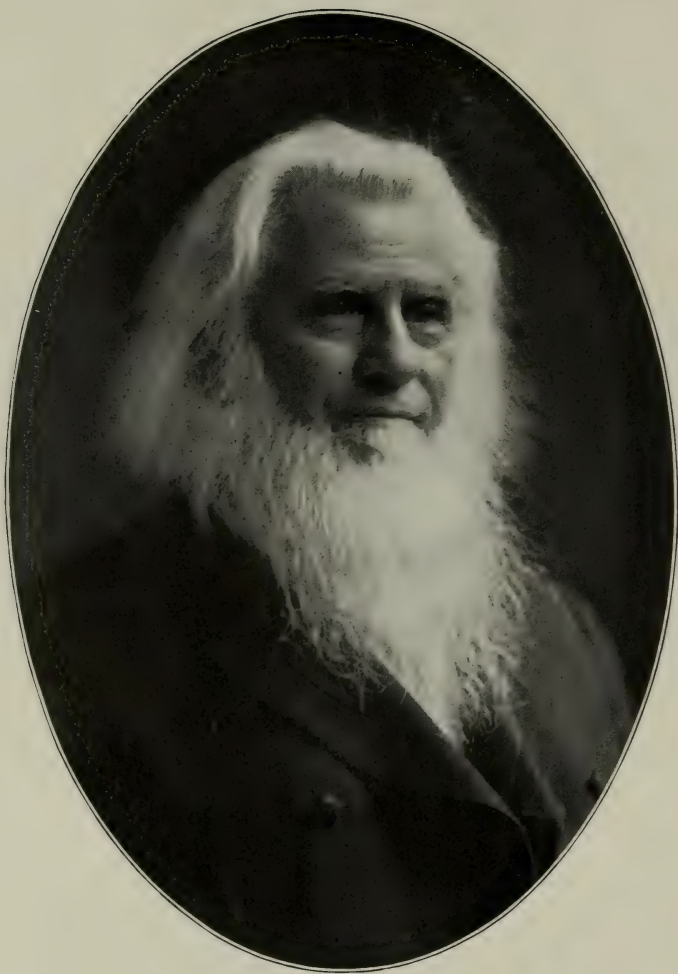
- No. 743,529, to ISIDOR LYMAN. Chip-blower and syringe attachment for dental engines.
No. 743,582, to WILLIAM S. STEIN. Tooth-brush.
No. 743,741, to ANNA MUELLER. Insufflator.
No. 743,817, to FRANK A. BREWER, Jr. and Sr. Riveting device for dental bridge work.

November 17.

- No. 744,204, to JAS. B. JORDAN. Dental lip and cheek supporter.
No. 744,291, to CASSIUS M. CARR. Anchored denture.
No. 744,292, to CASSIUS M. CARR. Anchored denture.
No. 744,358, to CHARLES T. KINSMAN. Dentimeter.

November 24.

- No. 745,070, to WILLIAM F. MCKIBBEN. Instrument for holding artificial teeth.
No. 745,071, to WILLIAM F. MCKIBBEN. Instrument for holding artificial teeth.



DR. T. B. WELCH.

THE DENTAL COSMOS.

VOL. XLVI.

FEBRUARY 1904.

No. 2.

ORIGINAL COMMUNICATIONS.

A METHOD OF CAVITY PREPARATION FOR PORCELAIN INLAYS IN THE SIX ANTERIOR TEETH.

By Dr. WM. H. CUDWORTH and ERNST J. EISEN, D.D.S., Milwaukee, Wis.

LITERATURE upon the subject of porcelain inlays is certainly not lacking in volume, and much that is before us at the present time is of creditable character, being the work of thoughtful, painstaking, and conscientious men. As we have learned, however, to regard certain rules in cavity preparation as logical and indispensable, so we must also recognize specialization of different kinds of work, and should come to some understanding as to what rules must be applied in such cases.

The fact that men who have well-defined ideas regarding the preparation of cavities for gold and alloy fillings can so easily depart from those lines when they take up porcelain as a filling material can only be accounted for by the fact that most demonstrations of the various porcelains have been made by commercial men, who not only had no well-conceived plan of cavity preparation, but wished the making of a matrix and inlay to appear as a most simple matter in which methods of procedure were of

little consequence. Anything like permanence, however, can only be obtained by the formation of cavities so shaped as to be correct from a mechanical standpoint.

To many, one of the apparent advantages of porcelain fillings is the ease with which they can be made; this idea, however, in the inexperienced, will lead to the most dire results, and one may ask in all good faith why the impression prevails that an inlay is expected to be retained in place through contact and the adhesion of a very thin layer of cement when no efforts have been made to get even the semblance of a cavity for its retention.

PREPARATION OF CAVITIES; AGENCIES FOR RETENTION OF INLAYS.

No text-books, we believe, attempt to discourage the idea of shallow and rounded cavities for inlays, and they devote but meager space to a chapter on porcelain fillings in general. When the ideas of operators differ as to the ad-

visability of inserting porcelain fillings which include the incisal edge, one cannot expect a text-book to include an elaborate treatise upon methods for the preparation of cavities for inlays. But the fact remains that innumerable practitioners are today inserting porcelain fillings in the anterior teeth which include the incisal angle.

By persistently adhering to certain rules and by paying that attention to detail which is more important in work of this kind than in any other, we believe that porcelain fillings rank in most cases with any other material as far as permanence is concerned.

The fact that there is so little tendency to a recurrence of decay can be accounted for by the free use of cutting instruments, thereby removing all infected structure and reaching the zone of cleanliness.

Those who have been successful with porcelain inlays attribute their success not to any peculiar advantages of the cement in retaining them in position, but to the adequate cavity formation. Whatever good qualities porcelain may have as a filling material vanish entirely where the preparation of the cavity has not been given that consideration which is absolutely required. Believing that the preparation of a properly shaped cavity is the prime requisite for success, we will now endeavor to advocate the merits of certain principles in the construction of porcelain inlays.

In advocating the preparation of cavities along certain lines we must take into consideration the means whereby we are to get a correct impression of a cavity. Certain authors have advocated an elaborate system of cavity preparation with the expectation of using a die and counter-die to obtain a correct adaptation, but we believe that a cavity simple enough to allow the burnishing of a matrix is preferable, and therefore we claim that any cavity here described can be properly and accurately reproduced through either gold or platinum foil.

Inlays with pins as the agent for retention have their advocates. Except in incisal restorations these are to be

condemned. A pin adds but little in the way of retention and lessens the inherent strength of the inlay, the weakening being almost in ratio to the size of the pin.

Cement plays a great part in the success of porcelain work, and but for it inlays would still be in an undeveloped state; yet its many good qualities must not be overestimated. It must not be expected to overcome the faults of poorly constructed inlays, nor to accomplish the impossible, and should not make us forget principles which stand at the head of dental science to-day. We therefore consider that a cavity should have such depth and angles that too great dependence be not placed upon the retaining powers of cement. Dislodgment of an angular substance is less likely than of one with a round surface.

Shallowness and round surfaces to facilitate the removal of a matrix should be discouraged as the worst possible practice in porcelain work. In addition to their advantages in the retention of inlays, angular cavities have other properties which make them desirable.

RELATION OF COLOR TO SHAPE OF INLAY.

An angular mass of porcelain enamel can be more readily made to assume the color of the tooth. When a ray of light strikes upon the outer surface of the inlay it is transmitted through an equal thickness of the translucent porcelain, an equal amount of light is absorbed in the various portions of the porcelain, and we have a uniform amount of light reflected from the posterior flat surface of the cavity. Not so, however, if the surface of the cavity be concave. Here the amount of light returned from the cavity surface of the thinner edge of the inlay is greater than that reflected from the apex of the concavity, and consequently the color impression created in the eye of the observer is not uniform, but varies with the thickness of the porcelain body through which it passes.

Another point may also be considered. As is well known, the angle of refraction

of light from a plane surface is equal to the angle of incidence. In the square cavity we are dealing with plane surfaces; the direct rays of light strike upon the porcelain, pass through this translucent substance, and strike the plane surface of the cavity, from which they are reflected in parallel lines, *i.e.* returned directly to the eye. In the round cavity we are dealing with a spherical reflecting surface, and the ray of light passing through the porcelain is not returned in a parallel line, but makes an angle with the incident ray and is returned to the surface at a different point from that of its entry. Thus it is very evident that the problem of the refraction of light is more easily solved by the angular than by the round cavity.

CLASSIFICATION OF CAVITIES.

A well-defined idea of the amount of tooth-structure to be sacrificed, the angle at which the matrix is to be withdrawn, and the point at which force will be applied when the inlay is in place, are the factors to be considered as the basis for each individual case.

In the preparation of cavities upon the labial surface of teeth the profession at large has used a method which is as sound today as ever, its simplicity making anything else impossible. The formation of such a cavity with a fissure or other flat bur has given us a flat base and straight walls. No variation in the preparation of such cavities, or the presentation of a different method, is here contemplated.

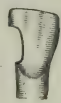
Cases of this nature have proved by years of eminently satisfactory service that porcelain has a place in dentistry, and today the only point of difference in the minds of the profession is to what extent porcelain should act as the restorative agent for lost tooth-structure.

Including the incisal angle commensurate with the amount of tooth-structure lost or to be sacrificed for the strength of the inlay, we classify approximal cavities in three divisions: (a) Simple Approximal; (b) Approximo-incisal; (c) Compound Approximo-incisal.

(a) SIMPLE APPROXIMAL CAVITIES.

The presentation of a simple approximal cavity calls for no definite variation in shape. In the majority of cases we will find that the area of decay has extended lingually, hence the destruction of the lingual plate of enamel is obligatory. The preparation of the cavity first requires the destruction of the lingual plate of enamel and the removal of all decay with excavators; an inverted-cone bur is then used to cut a seat at the gingival portion of the cavity at right

FIG. 1.



Front view.



Side view.

FIG. 2.



Lingual view.

angles to the axis of the tooth, and with this as our foundation, all other surfaces of the cavity should be cut at right angles or perpendicular to the gingival seat. The cavity as shown in Fig. 1 is ordinarily preferable, but where decay has not progressed extensively we may allow the lingual wall to remain as in Fig. 2.

(b) APPROXIMO-INCISAL CAVITIES.

Approximo-incisal cavities differ in shape where the position of the tooth and

FIG. 3.



Front.



Side.

FIG. 4.



Front.



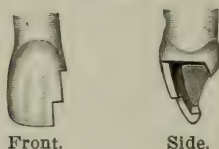
Side.

the amount of separation are to be taken into consideration. However, space is generally limited and the withdrawal of the matrix requires consideration. Hence the cavity in Fig. 3 fulfills the conditions. When the teeth are in juxtaposition and the incisal angle is involved, separation being obtained by mechanical means, the cavity would present the appearance shown in Fig. 4.

Often an inlay is indicated where separation is unnecessary, space being

present through various causes. In such cases an ideal cavity may be prepared, as shown in Fig. 5.

FIG. 5.



(c) COMPOUND APPROXIMAL CAVITIES.

Compound approximo-incisal cavities may be formed in a manner to overcome all weak points where direct force is met with. As a rule, the conditions necessitate their formation as in either Fig. 6 or Fig. 7.

FIG. 6.

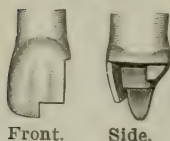
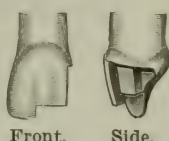


FIG. 7.



Approximal cavities in canines are classed as simple, no other designation being necessary except in isolated cases of restoration of the tip, where the general procedure is similar to the reproduction of the incisal angle in incisors. The irregularities in the shape of canines, however, make it quite impossible to recommend a cavity preparation suitable

for all cases. Fig. 8 shows a most favorable preparation, and where applied has proved the most successful.

The advantages of cavities formed upon a mechanical basis may be summarized as follows: The base is directly opposite the point at which force is applied; it is secure against the stress of lateral force; the point of greatest resistance is at the linguo-gingival angle. The refraction of light can be more definitely estimated and controlled by the symmet-

FIG. 8.



Approximal view.

rical formation of flat surfaces in the cavity. Cement is relied upon only in so far as its qualities are known to recommend it.

Accurate adherence to the principles here set forth is not always feasible, but in the majority of cases it is believed that cavities formed upon these lines will lead to greater success in the construction of porcelain inlays than will result from cavities formed without definite principles as to construction and which depend upon cement for retention of the inlay.

NEURASTHENIC MANIFESTATIONS IN THE ORAL CAVITY.

By LEO GREENBAUM, M.D., D.D.S., Philadelphia, Pa.

(Read before the Northeastern Dental Association, at its ninth annual convention, Boston, Mass., October 21, 1903.)

TO speak in detail of the many causes which have operated to place the dental profession upon the high plane which it at present occupies practically is to recount its monumental achievements of the past fifty years. And gratifying as is the general concurrence

of views that its practice has risen to a very high position, both in the ability to afford comfort and health as well as in its ennobling influences, we nevertheless must not rest content with past achievements but strive to further extend its usefulness.

The occasion of a recent address to graduates prompted an emphatic plea for a view of dental practice which to me appears not only as most important, but also affording us an excellent opportunity to invest it with something of the vital halo so markedly accorded to the practice of medicine. To demand this recompense we must make clear its justification. We must impress our patients with the importance of constant care of the mouth as an essential matter of personal welfare, and with the fact that our profession is able to correct defects which if allowed to remain would lead to serious complications, not infrequently jeopardizing the life of the individual.

My present purpose, however, is not to speak of those matters with which you are fully familiar, but to invite you to a consideration of conditions which when more carefully studied in all likelihood will aid in giving dentistry a full justification for the higher reward to which it is deservedly entitled. I refer to those phenomena exhibiting themselves in one or several ways in the oral cavity and indicative of some systemic disturbance, *e.g.*: The destructive effects of lithemia may be observed in the mouth months before urinalysis might lead to its discovery. Changes in the mobility of the tongue may give the first indication of degenerative processes in the medulla oblongata. The ascending infectious neuritis may have its origin in a defective tooth. Recent studies of the saliva appear to show that when its analysis yields certain substances expressive of abnormal chemical mutations we may therefrom suspect the existence of certain nutritional derangements which in time will assume the complete phase of a distinct morbid condition. When further researches shall have established the exact interdependence between the substances found in the oral fluids and the altered functions these reveal, and when this becomes common knowledge, together with its protective benefits, in the same sense as is today the ordinary practice of conserving the teeth, then it seems the practice of dentistry may be invested

with the degree of vital reverence at present denied it.

Within the same category of thought, but more specific to the present purpose, allow me to draw your attention to a morbid condition that is rapidly assuming an alarming importance because of the pronounced increase in the number of cases noted, its puissant bearing on the future of our people, and most significantly because its oral manifestations give us an excellent opportunity for corroborative diagnosis of its early appearance. The morbid condition to which I invite your attention is, according to the most competent authorities, an outcome of the high pressure and great wear and tear of modern civilization, and it is variously designated "nervousness," "nervous exhaustion," "neurasthenia."

THE NEURASTHENIC PATIENT.

Many of you have had occasion to observe among your patients some who have become nervous—who easily get excited and upset. They may tell you that they can no longer work as they did; sleep is poor. They will tell you that they suffer from headaches; that the heart palpitates; memory is impaired; there is but poor appetite; food lies heavy on the stomach, the bowels are constipated, and so on. They are depressed and worried, often anxious and fearful if left alone. Many of these patients become cognizant of the fact that certain changes have taken place, and seek medical advice, and when this is properly given and followed they avert the sad results that overtake the majority, who being unmindful of the danger signals soon find themselves in the throes of an insidious disease.

Neurasthenia is defined as being a "more or less marked and persistent diminution of nerve energy, together with an increased reaction, mental and physical, to external impressions; in other words, nerve weakness and nerve irritability. Careful studies of the changes caused by exercise in nerve cells of various animals have been recognized. They consist in a marked decrease in the

size and a change from a smooth and rounded to a jagged irregular outline of the nucleus, and marked shrinkage in size of protoplasm. Recovery takes place in such cells when normal exercise is followed by rest of reasonable duration. It has been further observed that after prolonged stimulation nerve cells become completely exhausted and cannot again return to the normal state. These facts clearly point to the rational pathology of neurasthenia: nerve cells exhausted beyond the normal limit and without the proper opportunity for rest and repair."

The condition is analogous, in a way, to the exhaustion of an electric battery in which the zinc plates have been consumed and the fluid charged with waste products.

In all tissue metamorphosis the result of exercise of normal function various waste substances are produced. These substances if excessive in amount act deleteriously upon the organism. In a sense they are poisonous. If present in normal amount they are under normal conditions properly eliminated. When there is an excess of waste substances, however, there is a corresponding increase in their toxic action. The accumulation of these poisonous substances causes a true auto-intoxication and consequent interference with various functions.

Their first action is that of a gradual inhibition of function. Function becomes progressively more and more difficult. Secondly, perversions of function are next apt to ensue. We are in this way, doubtless, to account for the emotional depression observed in many cases and for actual qualitative changes in mental action. It is extremely probable, further, that in conditions of chronic and prolonged fatigue abnormal waste products are formed which may result in such serious mental disturbances as delirium, confusion, or stupor, with their attendant hallucinations, illusions, and delusions. Our interest in this lies in its oral disclosures. If we succeed in detecting an oral symptomatology expressive of the early appearance of nervous exhaustion, and if the discovery be

made while rendering dental services, and the dangers indicated be properly presented to the patient, a factor will be established for a higher appreciation of our services.

ORAL MANIFESTATIONS OF NEURASTHENIA.

"Among the earlier symptoms in conditions developing neurasthenia we find disturbances of the secretions of the mouth. The disturbances consist, first, in a diminution of secretion; secondly, in perversion of the secretion." It is a common thing for a patient to complain of dryness of the lips and throat. This dryness appears to be due to an actual diminution of the secretions of the mucous membrane and of the salivary glands. It is remarkable also that in spite of the dryness of the mouth and lips, patients presenting these symptoms usually suffer from defective thirst. Further, when they do take liquids, the dryness of the mouth is not relieved. The character of the secretions is modified. There is a distinctly unpleasant odor which differs from the odor caused by the mere retention of particles of food between the teeth. A peculiar offensive odor, sometimes indeed stercoraceous, attended by disorder or perversion of the secretions, is frequently met with in exhausted nervous states.

Another marked symptom presented by patients suffering from nervous exhaustion is that of excessive tenderness of the gum, the gum being exquisitely sensitive to the touch of the finger and more or less sensitive to contact with food. Furthermore, the teeth may also share in this hyperesthesia. The hypersensitivity is not attended by any sign of gingivitis or other visible symptom.

My own experience with cases of neurasthenia has been too limited to permit of authoritative statements. However, a reference to the various medical authorities, especially the writings of Prof. F. X. Dercum of the Jefferson Medical College, fully justifies the statements made herein.

Disorders of the muscles of mastication

tion—of the muscles of the mouth, and particularly of the lips and tongue, are sometimes brought to the attention of the dentist long before the patient reaches a physician's care. Disorders of the muscles of mastication are, it is true, quite rare, but nevertheless they are now and then seriously affected, *e.g.* weakened or paralyzed, in such functional nervous disorders as hysteria. Weakness or anything approaching paralysis of the muscles of mastication would, of course, cause the case to be referred to a physician for examination. Again, marked tremor of the tongue, especially shrinking or apparent atrophy of that organ, would be facts of serious import. Similarly is it with impaired mobility of the tongue. The following case fully illustrates this important point:

CASE OF SPINAL LESION.

Mr. S.; past middle life. Loss of both upper and lower molars necessitated the construction of some mechanical device. As he objected to bridge work, we concluded to replace the lost teeth by introducing partial dentures on gold. These were adjusted in the patient's mouth and apparently subserved their purpose very successfully. About six months later the patient returned claiming that he experienced difficulty in speaking, which he believed to be due to the presence of plates. Very close examination satisfied me that some other cause than any appertaining to artificial dentures was responsible for the deficiency manifesting itself, and in closely observing the patient I detected a peculiar irregularity in the action of the tongue when speaking, denoting a central nervous lesion. I removed the plates from the patient's mouth and requested him to return in one week. Upon his return he stated that the absence of artificial teeth was a serious inconvenience to him, emphasizing rather than diminishing his former difficulty of speech. This, to me, was confirmatory evidence of my orig-

inal suspicion, and I resolved to communicate with his physician. In presenting my view of the patient's condition to the physician he ridiculed my contention of a central nervous disturbance, as no other manifestation of its presence could be detected, and warned me against disquieting the patient by imparting such a view to him, at the same time suggesting that I make better-fitting plates.

One year later a marked case of spinal disease had developed, and the physician admitted his lack of judgment in not accepting the oral evidence so early developed, and which might have been of inestimable value if utilized at the time of its appearance.

The following case illustrates the great importance of close observation by the dentist in the detection of neoplasms:

CASE OF EPULITIC NEOPLASM.

Mr. G.; age about forty. In making an examination of the mouth I found a most marked enlargement upon the gum about one-half the size of an ordinary bean, situated near the cervical border of the upper left central incisor. The color of the tumor was identical with that of the gum tissue. There was no evidence of irritation or pain. Further examination revealed a very delicate but distinct line of demarkation between the growth and the gum tissue, indicating a deeper origin of the tumor. Upon questioning the patient he positively insisted that the enlargement had always had its present appearance. I asked to be allowed to take an impression for future comparison. Eighteen months later the patient's physician consulted me with the view of making a comparison with the model, when we found a decided enlargement of the tumor. Its immediate removal was decided upon, and the operation and examination disclosed an epulitic neoplasm involving the periosteum of the outer plate of the alveolar process.

THE "A B C" OF CROWN AND BRIDGE WORK.*

By FRED. A. PEESO, D.D.S., Philadelphia, Pa.

(Continued from vol. xlv, 1903, page 466.)

TREATMENT OF BROKEN-DOWN TEETH AND ROOTS.

IN badly decayed teeth and roots, where the disintegration of the tooth-structure extends to or below the gum line, or where through accident the whole or a part of the root is broken away beyond that point, it is always necessary that the band should be carried beyond the line of fracture or decay, so as to prevent a recurrence of the decay and also to give additional strength and support and to render the splitting of the root impossible, or at least improbable.

It is well to discuss at this point a question which is really a very important one, viz, Should a tooth or root which is badly broken down be built up with amalgam preparatory to the placing of a band or a crown?

Though this is a custom which very generally prevails, it is, in the opinion of the writer, very bad practice. It is or should be very well known that gold and mercury have a very great affinity for each other. Everyone who has mixed amalgam knows how quickly the mercury will attack a ring or any other article of jewelry with which it may accidentally come in contact. It is this affinity which is taken advantage of in the treatment of gold by the amalgamation process, and the higher the karat the more readily is the gold dissolved by the mercury. If in the mixing of the amalgam the mercury could be entirely squeezed out of it, of course there would be no objection to its use; but that is impossible, and if it were possible the substance would no longer

be an amalgam. Whether the galvanic action which takes place between the different metals facilitates this disintegration or amalgamation or not, it is nevertheless an established fact that this breaking down does take place.

Then, too, the condition of the fluids of the mouth may have its influence, as it is unquestionable that this process goes on with much greater rapidity in some subjects than in others.

If a gold band comes in contact with an amalgam filling, even though the filling may have been in the tooth for many years, the mercury is certain to leave the alloy and attack the gold. Even if but the extreme edge of the band touches it the result will be the same, the mercury gradually working its way up the band and the gold crumbling away. Many instances of this kind have come under the observation of the writer where the whole side of a crown has been eaten away, or where a bridge has been completely destroyed, through contact with an old amalgam filling. In one instance, where a bridge extended from the upper left canine to the second molar, amalgam had been used in building up the canine root, with the result that not only was the band eaten away, but the union between the canine crown and the bicuspid dummy, where the gold was an eighth of an inch or more in thickness, had become so softened by the mercury as to give way under the stress of mastication, and the edges of the fractured parts were so thoroughly disintegrated as to crumble easily.

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Another peculiar case was where one end of the bridge was anchored to the lower right second bicuspid by a full gold crown. In the distal side of the first bicuspid there was a small amalgam filling that had been in for several years. There was no contact, there being at least a sixty-fourth or a thirty-second of an inch between the crown and the filling, and yet within a year the edge of the band had begun to crumble. In this instance the breaking down was probably due to or was assisted by galvanic action through the medium of the saliva.

Another case was where a bridge was set only temporarily for a few days, the bicuspid crown being in contact with an old amalgam filling, with the result that the crown was nearly ruined in two or three days.

In one case where the dentist set a full gold solid cusp crown with amalgam the patient returned the next morning with the cusp in his hand, the band having entirely disappeared.

The rapidity with which this disintegration takes place in some cases is undoubtedly due to the excess of mercury in the amalgam. Where the mercury has been thoroughly squeezed out and the amalgam packed very dry, of course the process would naturally be much slower.

If the band be made of crown metal, gold on one side and platinum on the other, or of platinum, there would not be the same danger, but it is safer not to have the band and the alloy in contact. A platinum cap is objectionable, owing to the great contrast in color with the rest of the bridge. Then, too, where the cusp of a platinum cap has been filled with gold, when ground through in articulating or worn by attrition the gold shows in spots, rendering it anything but attractive in appearance. A band made from crown metal generally looks far worse, as, in nine cases out of ten, when the piece is articulated and finished the gold is polished through in places, showing the platinum and giving the crown an ugly, mottled appearance.

It has been the experience of some to crown teeth or roots so built up with no

ill results following; but in these cases there has been no contact, a thin layer of cement being between the amalgam and the gold at the cervix, so that the band does not hug the tooth tightly, as it should, or the patient has not returned, so that the trouble was not made manifest to the operator.

It has been suggested that the tooth so built up be given a coating of varnish before cementing, but in this case if a little of the varnish be scraped off it will make a contact between the gold and amalgam, and the result will be the same as though the tooth had not been varnished.

If the tooth has been properly trimmed and the band accurately fitted there can be practically no layer of cement between the band and the root, as the surplus cement is forced out until the edges of the band come into actual contact with the root itself, or if it is built up with amalgam we again have the objectionable contact.

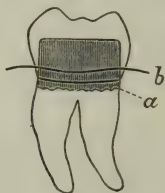
Another objection to building up the root, unless the band goes beyond the line of decay or fracture, is that in the majority of cases the filling is really *an element of weakness rather than of strength*. This may seem to be a very broad statement, but it is made in the belief that the facts will justify it, especially in the case of long bridges where there is considerable lateral strain.

FAILURE FROM ADAPTING CROWN TO BUILT-UP PORTION OF ROOT.

We will take, for example, a lower molar abutment where the tooth has been built up from far below the gum margin on one or more sides, as in Fig. 46, the filling extending for some distance below the edge of the band. The constant lateral strain during mastication on a tooth built up in this manner has a tendency to loosen the filling and draw it away from the base of the cavity with an ever-widening gap at the point A, Fig. 46, allowing entrance to the fluids of the mouth and causing decay which unless discovered in time will result in the loss of the tooth, as has actually been the case more than once.

The building up of any of the anterior teeth without extending the band beyond the filling is a detriment rather than a help. A tooth may sometimes be built up to facilitate the trimming and the fitting of the band, but if amalgam has been used it should be removed, or at least a thick layer of it cut away all

FIG. 46.



around as far up as the cavity extends, before setting the piece, even temporarily, so as to avoid any chance contact. Let the advocates of building up roots with amalgam do a little experimenting along this line, watch the results carefully, and publish them; it would be interesting, and the subject is of sufficient importance to merit careful consideration.

When roots are so broken down that the margins are far below the gum line it is next to impossible to make and fit the bands for them in the mouth so that there will be the perfect adaptation which is even more necessary in cases of this kind than where the crown of the tooth is standing, as the band will necessarily go to or below the border of the alveolar process. If it were possible to fit them accurately it would not only require a much longer time, but it could not be done without causing the patient a great deal of unnecessary suffering in fitting and trying the band on the root. The only way in which a band can be made and fitted on a tooth of this kind with comparative comfort to the patient is to secure an accurate impression of the broken-down root and make and fit the band to the model thus obtained and afterward adjust it to the root. It is not so difficult a matter to secure a per-

fect impression of these roots as it may at first seem, and this is one of the few cases where a plaster impression is not indicated.

TAKING THE IMPRESSION.

In cases in which the root is broken down to or below the margin of the alveolar process, some material must be used in getting the impression which will be stiff enough to crowd the soft tissues away and at the same time be capable of showing fine lines, so as to give an accurate outline of the root, however faint it may be, and also have the property of setting quickly. There are different materials which may be used for this purpose, such as wax, the various preparations of modeling composition, very quick-setting zinc oxyphosphate, dental lac, sealing-wax, or shellac. As a first example we will take an upper first bicuspid which has been broken down to or below the gum line on the buccal and palatal sides, the decay extending below the process mesially and distally, as in Fig. 47.

This is a condition frequently encountered, and anyone who has ever

FIG. 47.



undertaken to fit a band to such a root knows from experience the difficulties of such an operation. As a first step, if the gum overhangs the root very much it should be removed either with the lancet or gum scissors so that there may be fairly free access to the external surface of the root. The bleeding can be arrested by the free use of adrenalin chlorid. If there be not much gum tissue to remove, one or both of the canals can be partially opened and a sufficient quantity of cotton or gutta-percha packed tightly in to crowd the gum away, and

the taking of the impression be left for a subsequent sitting.

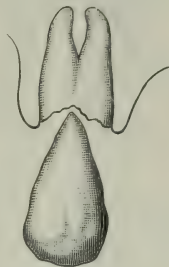
A good way to pack these roots when cotton is used is to first set a large-headed tack in the root with gutta-percha and then pack the cotton tightly under and around the head. If gutta-percha be used, the tack, with the exception of the head, is wrapped with gutta-percha, preferably base-plate, heated slightly and forced into the root, the excess crowding the soft tissues away. A small tray specially designed for this purpose can be used in taking the impression, or one can easily be made from thin brass tubing. An old cartridge-shell will answer the purpose very nicely. In size it should be slightly larger than the root and of about the same shape, and should be cut so as to follow the outline of the fracture or decayed portion.

If zinc oxyphosphate is to be used, it should be of the quick-setting variety and mixed very stiff, like dough. The tray is a little more than filled and the excess brought to a point beyond the edges. This point is then placed in the center of the root and forced tightly against it and held until the cement has hardened. Dental lac, shellac, or any of the other materials may be used in the same way. Dr. Wilson Zerfing is responsible for an excellent idea for getting a correct impression of these roots. A tube is used which is open at both ends. One end is shaped to conform to the root, and it is then filled with dental lac and pressed over the root when the lac is quite stiff. With an instrument handle or a piece of orange-wood it is then packed into the tube and forced over and around the edges of the root, giving a very sharp impression. The model is then made of Spence metal.

In the absence of these materials, paraffin and wax can be used. It is worked into the form of a cone and should be nearly full hard, so as to force the soft tissues away. Holding it in the closed hand for a few minutes will soften it sufficiently. The point of the cone is then placed in the center of the root and forced slowly (Fig. 48)—the warmth of the mouth softening it a little more—

until the gum is pressed back and the sides and end of the root are covered. It is then removed, when the outline of the root will be clearly shown. The

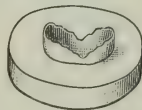
FIG. 48.



model can be made of plaster of Paris, zinc oxyphosphate, or Spence metal, and after it has thoroughly hardened it can be trimmed, following the outline and cutting straight down, leaving a stump to which the band can be fitted so as to carry its edges beyond the line of decay. (Fig. 49.)

Where there is a large cavity extending far below the gum line, an impression of the tooth after it has been trimmed, and of the cavity, should be taken, and on the model thus obtained the band can be fitted and carried to the

FIG. 49.

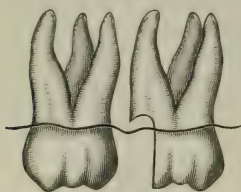


desired distance over the edge of the cavity. An impression of a tooth of this description can be obtained in the following manner. We will suppose that the case is of an upper molar (Fig. 50), where there is a large cavity on the distal side extending far below the gum line:

The mesial, buccal, and palatal sides should be trimmed in the regular manner as for a full gold crown. If the cavity be filled with gum tissue, it may be removed by excision or with trichloroacetic acid, after which it is packed tightly with cotton or gutta-percha, to

force away any remaining tissue and free the edges so that the margin can be

FIG. 50.

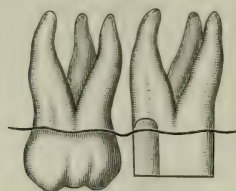


readily seen. If there be not much soft tissue it can be got rid of by packing cotton or gutta-percha as in the case of the bicuspid.

The decay should be entirely removed from the cavity, which should be made non-retentive in shape, as for an impression for a porcelain inlay, and any sharp points or thin edges at the margin should be cut away. The cavity is then filled and the filling trimmed even with the sides of the tooth and the extreme edge of the cavity, as in Fig. 51.

The filling may be of gutta-percha,

FIG. 51.

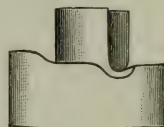


plaster of Paris, or zinc oxyphosphate, but the latter material is the best for this purpose. After it has hardened it is notched slightly on the distal corner so that it can readily be placed in its proper position in the impression.

If plaster has been used, it should be given a coating of varnish or of a soap solution and the impression taken in the regular way with plaster of Paris. When it has hardened and been removed, the filling is taken from the tooth, replaced in the impression, and held in position with a very little hard wax. The cavity should then be packed with gutta-percha to keep it from filling up while the crown is being made. The impression

is now varnished and the model prepared. When it is separated and is thoroughly dried, it is trimmed in the manner already described, to about one-sixteenth of an inch below the gum margin, and on the side of the cavity

FIG. 52.



to about one thirty-second of an inch below its edge, the filling serving as a guide. (Fig. 52.)

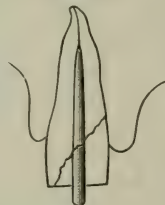
FRACTURES OF THE ANTERIOR TEETH.

The anterior teeth are more subject to accident than any of the others, and it is not an uncommon thing for one or more of the incisors to be broken off, the fracture extending far up on the labial or palatal side of the root, as in Fig. 53. In a case of this kind the sides of the root not included in the fracture should be trimmed, and cotton or gutta-percha packed tightly in the palatal side

FIG. 53.



FIG. 54.



as far up as the break extends, and allowed to expand so as to give free access to the broken surface. When it is removed, a filling of cement is put in, restoring the root and allowed to extend about an eighth of an inch from the gum margin. (Fig. 54.) It is then notched and the impression taken. The model Fig. 54 is prepared as in the previous case, the filling having first been removed and put in its place in the impression.

In a break of this kind it is often well to restore the broken part entirely with gold. This can be done by burnishing very thin pure gold or platinum over the fracture as outlined in the model, and then building it up to the normal shape of the root with coin gold. The band is then made with this inlay in place and soldered to it, when the crown is made.

The buccal wall of the upper bicuspid is also frequently broken far up on the outside of the root, and it can be treated in the same manner.

DIVIDED ROOTS IN A MOLAR.

Another form of trouble which frequently confronts the dentist is that of divided roots in an upper or a lower molar. It sometimes happens that the two roots of a lower molar are all that there is, back of the first or second bicuspid, to help support a bridge. Such roots as these are almost always consigned to the forceps, but if they are fairly firm in their sockets they will often, if properly prepared, serve as a support for one end of a bridge for many years. Even if they are somewhat loosened, by giving them something to do they will frequently become almost as firm as they ever were.

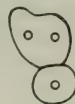
Where the roots are separated for a little distance, they should be banded separately, but where there is a fracture across the bottom of the pulp-chamber they should be drawn together in close contact and held in position with a staple or pins. A staple is preferable, as it is stronger and if made right will draw them tightly and hold them.

It often happens that the palatal root of an upper molar will be separated from the others where the tooth has been broken down to or below the gum margin. A description of such a tooth which was prepared and crowned twelve years ago and is still perfectly firm will illustrate the method of treatment: The tooth was an upper left second molar the crown of which was entirely gone, the palatal root being completely separated from the two buccal roots, as in Fig. 55. The patient was advised to have them

extracted but would not hear of it, so it was decided to crown them.

The roots were first carefully trimmed so that a band could be put on without

FIG. 55.



its cutting into the gum. A piece of wax was then pressed over it to crowd the gum away, and held in place some little time. The plaster was then mixed and the impression taken the instant the wax was removed and before the gum

FIG. 56.



had time to return to its former position. The model was prepared and the band made to fit, the edges being pressed in sharply where the palatal root joined the two others. (Fig. 56.) The next step was to open and enlarge the palatal and disto-buccal canals so that they would take a wire of about 16 gage. The staple was then made of platinized gold wire

FIG. 57.



and shaped in such a way as to draw the parts tightly together and at the same time give a very strong attachment for the cement to hold the crown. (Fig. 57.) The canals were now filled with cement and the staple forced into place, the points being sprung together with a strong pair of pliers to enter them, as the roots diverged toward their apices. The band was then placed on the root, the articulation taken, and the crown made, being reinforced with a little

solder at the bifurcation to prevent its spreading, and cemented in place.

This is only one out of many which have been treated in the same manner, and so far as the knowledge of the writer goes there is yet to be recorded the first failure. Of course, good judgment must

be used as to how far gone a tooth may be and still be amenable to treatment. This staple is not only useful where the roots are separated, but in many cases where there is not enough of the tooth left to hold a crown.

(To be continued.)

THE HISTORY, LITERATURE, AND UTILITY OF ZINC OXYCHLORID AS A ROOT-CANAL FILLING.

By C. W. STANTON, D.D.S., Buffalo, N. Y.

(Read before the Seventh and Eighth District Dental Societies of the State of New York, at their thirty-fifth annual union meeting, Rochester, N. Y., October 27, 1903.)

ZINC oxychlorid was apparently first used by Sorel in Paris in 1856, as a material for stucco work.* Dr. Roberts, of "Os artificiel" fame, gives its dental origin in this somewhat poetical manner: "Just ten years past the middle of the nineteenth century"—which means in 1860—"it rose as a bright star far in the north of Germany, swept rapidly over Prussia and southern Germany and France, and, like the German emigrant, scorning England's shores, strode boldly across the broad Atlantic to America the father of dentistry, where it has become vastly improved and has won its way in nearly every dentist's office from the Atlantic to the Pacific."†

Since its advent it has had three distinct historic periods:

First, as a general filling material in all cases where gold could not be used owing to frail walls or for pecuniary reasons. This period lasted for about ten years, from 1860 to 1870. It was sold largely as an artificial bone, and the older of us readily recall "Roberts' Os artificiel," manufactured by Charles H. Roberts, M.D., a dentist of Poughkeepsie, N. Y.

This decade of service showed the

weakness of this material as a general filling, as it wore away rapidly under mastication and dissolved at the cervical margins.

The second period was from about 1870 to 1880 or 1885, when it was in quite general use as a lining of frail cavity walls, but more especially as a capping of exposed or nearly exposed pulps. For this latter purpose it was a universal fad.

Some of us recall as but of yesterday, the spectacle of our spectacled enthusiast, Dr. Atkinson—in his shirt-sleeves quite likely, if the weather was warm—describing as only he could, with unbounded faith and enthusiasm, his manner of procedure: How the exposed pulp was flooded with carbolic acid, which sweetly kissed the weeping plasma, transforming it into a carbolate of albumin that like a coat of mail protected it from the creamy zinc oxychlorid, which was gently tapped over it, and the angels lent their gracious benedictions. But time, which proves many errors, apparently showed that the angels were too busy to watch carefully enough these cases, and the capping of exposed pulps with zinc oxychlorid, as well as the use of it as a general filling material, gave way upon the discovery of its much less irritating successor, zinc oxyphosphate.

* E. T. Darby, *COSMOS*, vol. xxxvi, p. 180.

† *Ibid.*, vol. i, p. 573.

The third historic stage really extends from the beginning, overlapping both the first and second stages. From the first it has been used more or less as a filling for root-canals, and since 1880 to 1885 this has been about its only use.

ITS LITERATURE.

Its literature has at times been very abundant. Hardly a dental journal was issued from about 1860 to 1880 that oxychlorid did not receive some mention. Not a dental gathering from the lowest to the highest but what discussion took place upon the merits or demerits of this material. My first attendance at a meeting of the American Dental Association was at Niagara Falls in August 1866. I well remember in that upper story right under the hot flat roof in Grant's Hotel how they debated this subject until I was mighty sick of it. Dr. Wetherbee of Boston, who had been a minister and who never forgot either his ministerial manner or dignity or tone, was a strong advocate of it as a pulp-capping. He offered, if the association would hold its next meeting in Boston, to produce a score of patients for examination whose pulps had been capped and were still alive.

So, while there has been at times much literature on this subject it has not been permanent, but ephemeral.

ITS UTILITY.

The third division of my subject, the utility of zinc oxychlorid as a root-canal filling, is by far the most practical and essential point of our subject, and well deserves our chief attention.

It is really one of those curious things in dental literature and practice to read up, as I have done in the preparation of this paper, and see what has been taught—taught with zeal, ability, and sincerity, and by good men, men who have made the practice of dentistry what it is in America—in regard to the practice of filling root-canals.

We are surprised occasionally nowadays with the apparent foolhardiness

of someone who advocates leaving root-canals with no filling at all, but that has been the practice of some of the strongest men we have had in this country—while cotton raw, cotton medicated, wood, lead, metallic zinc as well as its different preparations, shellac, feathers, gold, gutta-percha in its various forms, amalgam, wax, resin, sulfur, and many other things too numerous to mention have been used. Surely our practice along these lines has been far from an exact science. Before the advent of cohesive gold, the orthodox practice among the best men in our specialty was to use gold only in filling root-canals. It is rather quaint reading to us to read how they wound the strips of soft foil about their three- or five-sided broaches and wound them up to the end of the canal, then unwound the broach, etc. Some of us who thirty to forty years ago had occasion to take out some of these gold fillings have no difficulty in recalling the septic conditions, the pent-up gases, the bad odor.

Going to call on our family dentist once when on a visit home during my dental pupilage, probably in 1865 or 1866, he narrated to me with considerable righteous indignation a case recently in his hands for treatment. The lady was from Washington, D. C., a patient of a prominent dentist. He found it necessary to remove the filling from a recently devitalized tooth, when he found three different materials used before he reached the end of the root and not a bit of gold in this root-canal, although gold had been supposedly paid for.

For the last forty years the two chief materials used have been either zinc oxychlorid or gutta-percha in some of its forms. Which has been the most used would be hard to say. Dr. Talbot* said in 1892: "I presume gutta-percha is more used today than any other material, and yet it is the most nonsensical material ever used in filling pulp-canals. Ever since I have been in practice (about 1871) I have found invariably in open-

* COSMOS, vol. xxxv, p. 233.

ing nerve-canals filled with gutta-percha, even if filled for only six months, a strong odor of sulfuretted hydrogen, which is never the case when the filling is of zinc oxychlorid."

ZINC OXYCHLORID OR GUTTA-PERCHA:
WHICH?

Dr. James Truman* said in 1888: "We are no nearer a settled policy in this matter than we were forty years ago." He advocates the employment of the oxychlorid and strongly condemns the use of gutta-percha.

If numbers or common usage settled anything in our practice, it would be easier to settle some things which remain unsettled. We are a remarkable people—we dentists—in chasing after will-o'-the-wisps. We have been wild against amalgam; wild in favor of it; wild on copper amalgam; wild on soft foil; wild on cohesive foil; wild on crystal gold; wild on celluloid; wild on zinc oxychlorid as a general filling material, and as a pulp-capping; wild on cataphoresis; and probably in a few years we will be looking back on these days as a time when we were very wild on porcelain inlays.

So we have no reasonable hope that we are to settle at this time the old, oft-debated question as to the relative merits of these two materials. Still the search for truth is an eternal one.

Until we had hydrogen dioxid we had no means of really removing the minute bits of pulp tissue from the pulp-canals. We tried to scrape them out with the barbs of our broaches, to wipe them out with cotton, to embalm them and mummify them with medicaments, but remove them we did not until hydrogen dioxid gave us the most potent factor we have today in the treatment of pulp-canals—the bringing about of a condition of surgical cleanliness before unknown to us, that which makes the name of Lister the brightest name in modern surgery.

A good many definitions have been given of what a root-canal filling should

be, some of them too long and too special. I think we can agree on two necessary qualities. The material should fill the canal, and it should remain unchanged. Some might desire the two additional qualities, ease of insertion and ease of removal. I do not include them, for while there is no virtue in difficult manipulation, we at no time admit the propriety of any method because it is simply easier—and thus, too, personally I feel that the filling with gutta-percha, especially the solution of gutta-percha and chloroform, is about the dirtiest, sloppiest method we have. And the second point, ease of removal, has no real weight, if we find a material that does away with the need of removal. Gutta-percha is usually employed at first in solution in chloroform, this to be followed by points or cones so condensed as to make the material as solid as may be. But the very best condition attainable with gutta-percha would seem to be a mass of material moistened with chloroform, which sometime will pass out of this material, either by evaporation or endosmosis, leaving a shrunken cone only partially filling the cavity. This explains in part the almost universally admitted fact that a gutta-percha canal-filling has a bad odor.

At the meeting of the American Dental Association at Old Point Comfort in 1894 our own beloved S. B. Palmer had a paper containing some very valuable demonstrations on the filling of ultimate points of pulp-canals.* He went over these demonstrations in the office of the Hygeia Hotel, before Dr. Frank Abbott of New York and myself, previous to the reading of his paper before the association. Dr. Palmer had a lot of glass tubes, which had been softened in the flame, drawn out, and then broken, so that they resembled the roots of teeth with an opening so fine as to be invisible to the eye, like the foramen of the normal root. With these tubes standing on cotton wet with colored water he demonstrated the utter impossibility of per-

* *International Dental Journal*, 1888.

* *Cosmos*, vol. xxxvi, p. 862; *Trans. American Dental Association*, 1894, pp. 145, 146.

fectly drying the very end of the pulp-canal. Following every attempt the colored water would back an appreciable distance up the tube, and every gutta-percha filling introduced showed a point at the end resembling soap or cheese instead of gutta-percha. But the zinc oxychlorid, mixing as it does with water in all proportions, could be carried to the extreme end and would even drive the colored water out before it and perfectly fill the very minute end of the canal. Here was a demonstration most convincing, which left nothing to be guessed at.

Do we really fill the canals full with oxychlorid? When I went to Buffalo, in October 1872, I went into the office of an oxychlorid enthusiast, Dr. A. P. Southwick. I have since that date used zinc oxychlorid almost to the exclusion of everything else. Of course in these thirty-one years I have often examined extracted roots which had been filled years before, and upon splitting the roots open have found a dense, hard material free from odor, and generally found the canal full. In several cases where there had been considerable absorption of the end of the root, I have found the oxychlorid beyond the absorbed roots. A dental friend told me last year that he had seen such a condition in a root that the patient told him I had filled a number of years before. I believe that the zinc oxychlorid fills the space as nothing else does. But I fancy exception will be taken at once to the claim that a material introduced in thin creamy consistence will so perfectly fill the canal as is claimed. Zinc oxychlorid is used first thin—very thin—and that, too, without thoroughly drying the pulp-canal.

Dr. S. Eschelman, in a paper read before the Eighth District Dental Society in April 1897,* made an excellent remark on this point. He says, "We should not make the canal dry in filling with this material. If the canal is dry the moisture is absorbed before the filling reaches the extreme point." Dr. Frank Abbott, in discussing Dr. Palmer's paper

already referred to, makes practically the same point. Remember, we are using a practically hydraulic cement. If you watch the workman using any hydraulic cement, you will see the cement is not only nearly fluid, but everything with which it comes in contact and with which it is to unite is wet also.

I was interested this summer in watching some changes being made near me in a building belonging to our street railway system, to prepare for the installation of storage batteries. Very strong foundations were needed, and considerable pits were dug, and these were filled with concrete for the foundations for the columns. Happening around one evening after the workmen had gone, I was not a little surprised at the perfectly wet, saturated, sloppy surface left on the top of one of these piers. But a day or two after I saw it again, and what had been a muddy surface was now perfectly hard, and a few days later massive steel columns stood where this sloppy surface had been.

I believe the oxychlorid fills the canal more perfectly and remains unchanged better than any other material. No one, to my knowledge, has ever claimed for the gutta-percha that it had any antiseptic or germicidal quality any more than so much wood pulp. Hence the mixing with it of various medicinal agents such as carbolic acid, aristol, corrosive sublimate, hydronaphthol, formalin, and nearly every agent used by us. Zinc oxychlorid is an antiseptic, and has been known as such from the beginning. For forty years it has been known as the only material which will absorb the gases from the root-canals and itself remain unchanged. It is the only antiseptic material yet found which we can use as a filling material in the root-canal.

What is the condition found when we need a canal filling? If it be a case of recent devitalization, we have by means of hydrogen dioxid the main portions of the pulp removed, but with the contents of the dental tubuli practically intact. In an old case, especially where pus has

* COSMOS, vol. xxxix, p. 459.

been present, we have the dental tubuli saturated with germs. In my own practice the fresh cases are filled with oxychlorid as soon as the foaming ceases from the hydrogen dioxid. The second class are treated with Black's "1, 2, 3," about three dressings of two days each, then filled. New trouble with these cases after filling is really no part of my trouble in dental practice. I make no claim to infallibility, but this is one of the things that does not annoy me; and yet this method has been my reliance for over thirty years. I know how unsatisfactory anyone's memory is as against a well-kept record of cases, which I cannot quote. I moved my office to my residence just eleven years ago, and since that comparatively recent date I can recall only two cases where attempts have been made to remove canal fillings for treatment. Both were left lateral incisors, very small, and in both cases I failed to find the foramen and refilled and had no more trouble. There may perhaps have been others, but I cannot recall them.

SOME TESTIMONIES TO OXYCHLORID.

Has my experience been unusual? Let me cite you the experiences of men who need no introduction to you. Dr. Bogue writes me that he never expects trouble: "I have no solicitude about those roots to the last day of the patient's life."

Dr. Storey,* before the Southern Dental Association, August 1889, says: "For fifteen years I have not had a failure, to my knowledge."

Dr. George Cunningham† gives 512 cases where canals were filled at the first sitting and only eleven reported trouble.

Dr. Jenkins of Dresden* says that when he gets roots which have been filled with zinc oxychlorid they are always healthy, and he can go ahead and do what he wishes with them at once; whereas, if they have been filled with gutta-percha they invariably have to be treated and filled when he can get them ready to fill.

These quotations might be greatly multiplied.

A WORD ON THE MANIPULATION.

Perhaps a word ought to be said as to the manipulation. Dr. Southwick used to think if a little free chlorid got through the foramen, it was a good sign and did no harm. *Per contra*, Dr. Bogue, because he has sometimes had such irritations, always seals the end of the canal with a minute bit of cotton and carbolic acid. Dr. S. G. Perry fills the extreme points with gold or gutta-percha; but Dr. Perry can do what some of us cannot do.

If we have such a material in zinc oxychlorid as has been shown—the only material which will take care of the always possible and often probable gases in the pulp-canal, the only really antiseptic material yet known, a material as easily used as any, which fills the pulp-canal as perfectly as any and fills it more permanently than any other, which fills canals so successfully that many of our best men, such as Marshall Webb, Varney, Bogue, James Truman, Jenkins, S. G. Perry, Talbot, and hosts of others, say they never expect trouble to follow—I ask, If this be true, why are we still using wood, chaff, hay and stubble, instead of the right thing, in filling root-canals?

* COSMOS, vol. xxxi, p. 810.

† *Trans. International Dental Congress*, 1889.

* COSMOS, vol. xlv, p. 546.

PARALLEL EXPANSION OF THE LOWER DENTAL ARCH.

By HENRY N. DODGE, A.M., M.D., D.D.S., Litt.D., Morristown, N. J.

THE writer has long sought for some appliance whereby the lower dental arch might be evenly expanded side-wise, the two sides of the arch being kept approximately parallel.

The usual appliances, acting unevenly upon the side of the arch, press them apart as if by the opening of a pair of scissor-blades, supposing the hinge of the scissors to be placed at the lingual surface of the incisors—more pressure, in consequence, being made upon the molars than upon the bicuspidis or canines.

When the molars and bicuspidis are irregularly placed in the arch it may be

FIG. 1.



desirable first to arrange the individual teeth, and afterward spread the two sides of the arch evenly apart. For the purpose of placing the individual teeth in line the simple appliance shown in Fig. 1 may be used. This is made of rubber stiff enough to have but little spring, and clings to the lingual surface of the arch around its whole extent, without interfering in any way with the articulation. Bearing upon the lingual surface of each tooth to be moved outward is a screw made of No. 13 gold wire, the head of the screw being made to fit a watch-key, and being slightly

rounded where it rests against the tooth. With a drill and tap which exactly fit the screw the latter is easily inserted in the rubber plate, care being taken to give it the right direction and to countersink the head to a level with the rubber. This screw is shown in Fig. 2. Several

FIG. 2.



(Twice actual size.)

lengths may be used in succession. With the watch-key the screw is turned from time to time to push the tooth into place.

For the parallel expansion of the two sides of the lower arch, after the individual teeth have been placed in position, a very different appliance is used. Two rubber sections, made to fit the lingual surfaces of the molars, bicuspidis, and canines on either side of the arch, are connected at their anterior extremities by a gold tube and rod, both cut with a screw-thread, the rod (of No. 13 wire) turning into the tube.

Upon this screw-cut rod or wire is a check-nut as shown in Fig. 3. Both the

FIG. 3.



rod and the tube are very strongly anchored in their respective rubber sections.

To adjust this powerful appliance, the check-nut is loosened and one of the rubber sections turned upon the other, until the whole fixture will fit tightly into the lower arch, going to its place with a snap. The check-nut is then tightened to hold the screw fast in the tube, or it may be tightened before the appliance is pressed into place.

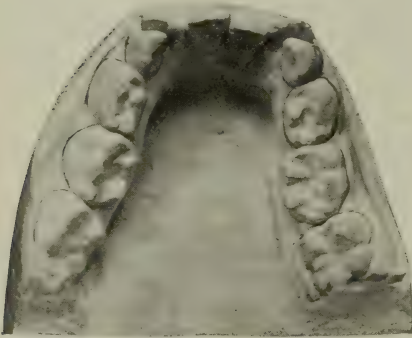
When the appliance begins to fit too loosely in the arch, in consequence of the

again tightened and the whole replaced in the arch. By this means the lower dental arch may be expanded at will, keeping the two sides in the same relative position, the force being evenly distributed from molars to canines.

The results obtained in a case of expansion by this method are shown in the accompanying illustrations. (Figs. 4 and 5.)

Some experiments have been made by

FIG. 4.



Condition of mandible prior to orthodontic intervention—January 1897.

FIG. 5.



Condition of mandible—May 1901.

movement of the teeth pressed upon, it is removed, the check-nut turned back, and one section revolved upon the other one or more times. The check-nut is

the writer in applying the same principle to the expansion of the upper dental arch, but no definite results can yet be offered.

NEW METHODS OF DENTINAL ANESTHESIA.

By G. MAHÉ, M.D., Paris.

(Abstract of a paper read at the Section on Odontology and Stomatology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

ANESTHESIA in dentistry is not so important a matter as it is in general surgery, but it is certainly more complex and difficult to obtain.

In general surgical practice one has generally a preferred method of anesthesia from which rarely if ever any departure is made, and which from its being so frequently practiced gives the desired results in nearly every case with almost mathematical precision—excepting, of course, certain reactions which are not considered in the operating-room to the same extent that they are in professional literature.

In the practice of dentistry there is not a single operator who can pride himself on even approaching such uniformity of methods and results. In dentistry the employment of general anesthesia—which, while possessed of certain dangers, nevertheless presents on the other hand many advantages—is a true exception, and we differ as much upon the methods of inducing it as upon the indications for its employment.

Thus, apart from certain difficult or multiple extractions, and from some parodontal interventions which necessitate and warrant the administration of general anesthesia, in our daily practice it is usually local anesthesia which we are called upon to use. The sensitivity of the pericementum, of the pulp, or of the dentin respectively cannot be subdued by the use of the same means, as the peculiar characteristics of each of these organs necessitate the employment of different methods. Of these three different conditions of pain, hypersensitivity of the dentin is the one most fre-

quently encountered in dentistry, and the most difficult to treat.

Notwithstanding the numerous investigations that have been carried out on the subject, it must be admitted that practitioners do not as a rule attach to this question of local anesthesia the importance which properly belongs to it. This is to be accounted for by recognizing the facts that the kind of pain under consideration is not of a nature to endanger life, and that, further, it ceases with the operation. This localized pain which results from an insignificant lesion is neglected by the operator probably because it is quite difficult to conceive that such a diminutive organ as a pulp may be the cause of such violent suffering.

Considering, therefore, the importance of the subject under consideration I propose to review some of the agents and means that have been used and recommended for the treatment of such disturbances.

(a) MENTHOL.

Although menthol is not as yet generally known in connection with the treatment of sensitive dentin, and notwithstanding its being an "heroic" agent, I yet consider it one of great value, both from the rapidity with which it acts and from its innocuousness and the simplicity of its application.

The employment of this drug is based upon its well-known analgesic and antiseptic properties. As menthol is insoluble in water, it is logical and necessary to dehydrate the dentin in order that it may be possible for the drug to exercise

its action. The rubber dam should be applied and the dentin dried by means of hot air and alcohol for two or three minutes. This is the *modus facendi* which I recommended and published in *l'Odontologie* in January 1900. Since that time the dehydration of the dentin has been looked upon by French dentists as a subject worthy of investigation, and my own studies have shown me that laboratory methods of dehydration are not in any way superior to the simpler method which consists in the use of hot air and alcohol. As to the use of absolute alcohol I wish to restate what I expressed in my first paper in *l'Odontologie*, namely, that the alcohol should be preserved with calcined copper sulfate, which constitutes a good test for its purity. It should be applied slightly warmed, as otherwise its application on the already sensitive dentin is followed by an undue amount of pain. Upon the dentin when thus prepared the menthol is applied. Into the cavity is inserted one drop of a solution of equal parts of menthol and absolute alcohol. The cavity is then dried partially and an attempt at excavating is made. Frequently a single application is not sufficient, and a second one has to be made by introducing into the cavity several crystals of menthol, which are made to fuse slowly by means of hot air. The menthol is thereby transformed into a liquid, which will spread over all the dentinal walls. It is again slowly evaporated by means of hot air, without, however, carrying it to the point of desiccation, as the walls should remain impregnated with the remedy. A few minutes should then be permitted to elapse before undertaking the excavation of the cavity.

Before inserting the permanent filling the excess of menthol is removed by means of irrigations with alcohol and successive evaporations with hot air.

With the method here described it is possible to obtain an immediate temporary and superficial analgesia of the dentin. For long and delicate operations it may become necessary to make several applications, because, as stated,

the analgesia obtained is only temporary. If analgesia be not obtained five or ten minutes after the beginning of the application, the case is certainly one which will not respond to this treatment, for with menthol the anesthesia is produced immediately if at all.

Menthol does not alter in any way whatever the vitality of the tissues to which it is applied. I wish to state again that while often very successful, this method does not always produce the desired results.

Regarding the sensitivity of the dentin, I am inclined to divide it into two kinds, viz, anatomical and nervous. Sensitive dentin of the anatomical type may be due to a greater number of tubuli, or to their being of a larger diameter, while sensitive dentin of the nervous type is due to an exaggerated irritability of the nervous system.

Menthol is not exclusively an analgesic, as it possesses antiseptic properties as well. Therefore when it anesthetizes it renders the dentin to a certain extent antiseptic.

(b) ERYTHROPHLEIN.

Dr. Dalma has advocated the method which Dr. Rublutch recommended, and which consists in the employment of erythrophlein hydrochlorid. This author uses a solution of the alkaloidin eugenol. A dressing of this combination he applies in the cavity and covers it up with cement.

My experience with erythrophlein has not been successful. While we will not pass in review the physiological action of this alkaloid, we think it proper, however, to point out the extremely toxic character of the drug, together with the further fact that if it anesthetizes the dentin its application is generally followed by intense pain. The employment of erythrophlein is contra-indicated from the fact that it causes intense pain which lasts for a considerable time.

The first occasion on which I used erythrophlein it was employed for the purpose of removing a pulp a cornu of which was exposed. The pulp was extirpated without pain ten minutes after

the application, but later on the patient suffered from pulpitis, pericementitis, and neuralgia, which lasted for several days. In a second case I made an application according to Dalma's method; the case was one of hypersensitive dentin of exceedingly acute character. The anesthesia of the dentin was perfect twenty-four hours after the application, but again the patient suffered from pulpitis and pericementitis. The same consequences were also observed in a third case.

(c) FORMOL.

Dr. Rodier of Paris has recommended a method of obtunding sensitive dentin which consists in the employment of a paste of equal parts of formalin and creasote and one per cent. trioxymethylene. This paste is left in the cavity for two or three days under a gutta-percha filling. The application is followed by intense pain which may last from one to ten hours. This is followed by an absolute insensibility of the dentin. According to Dr. Robin, under the influence of this combination it is possible to excavate the dentin without causing any pain whatever, and my own experiences confirm Dr. Robin's observations. He believes that here formol acts by "fixing" the ends of the dentinal fibrillæ, thereby preventing the transmission of impulses.

But we fear that formol has a tendency to devitalize the tissues upon which it is applied, and especially the central organ, *i.e.* the pulp, for as it happened to Dr. Robin and to myself—we found that after the application of this dressing we could enter a pulp-chamber without exciting any pain whatever, and this of course indicates that the vitality of the pulp has been impaired by the action of the formol. If, however, the application be not allowed to remain in the cavity for more than twenty-four hours, the action of the drug is superficial and the deeper layers of dentin exhibit a certain degree of sensitivity. It has been further affirmed by Dr. Robin that in certain cases it has been possible to observe a true regeneration of dentinal sensitivity, and that this

phenomenon in itself is a sure symptom that the vitality of the tissues is not impaired. Dr. Robin is of the opinion that formol in "fixing" the fibrillar extremities creates *ipso facto* a sort of limiting membrane which renders the penetration of the formol extremely slow. This "fixation" with formol presents the peculiarity that it seems to differ from coagulation, such as occurs with the employment of corrosive sublimate or alcohol.

Not wishing to discuss this topic any further I will state in addition that formalin is an excellent histological "fixer," and that it is not in itself capable of precipitating albumin. It is further interesting to note that by means of formol it becomes possible to anesthetize and at the same time to disinfect the dentin. The menthol method which I have advocated presents the advantage of being rapid, but on the other side it has the disadvantage of not being constant in its action, while the formol method advocated and recommended by Dr. Robin, although slow in its action, is valuable because it is always constant. The employment of menthol requires that the dentin should be dehydrated before the agent is applied; formol acts upon moist dentin. The experiments that I reported in a previous communication have demonstrated that while dehydration is indispensable to cause the penetration within the dentin of a medicament insoluble in water and soluble in alcohol, it is illogical and utterly useless in the case of medicaments soluble in water and diffusible. Formol, with its great diffusibility and with its classic antiseptic properties, may be considered a perfect therapeutic agent in this connection.

I must here enlarge upon the subject of the pain which accompanies the application of formalin, which is certainly a great disadvantage for an obtundent. I have devoted considerable attention to the study of this problem, endeavoring to devise means by which this disadvantage may be eradicated. My first thought was to renounce the use of free formol, and to avail myself exclusively of the action of nascent formol, as it

may be obtained from trioxymethylene. To counteract the pain I made use of orthoform, and in order to make the trioxymethylene into a paste with orthoform I used carbolic acid. The paste is easily mixed and manipulated. This combination has given me most satisfactory results; the anesthesia which it brings about, however, takes longer to set in and is not so deep in extent as that obtained with the previous formula, though its application is not so often accompanied by pain as with the previous preparation, and further, the pain (if any be present) is not intense.

The preparation which I am using at present is as follows: Crystallized menthol 5 parts, crystallized phenol 4 parts. This pheno-menthol mixture is a syrupy liquid at ordinary temperature, and may be made into paste before using by mixing it with equal parts of trioxymethylene and orthoform.

The paste is applied in contact against the walls of the cavity, and is covered up with a small pellet of cotton and sealed in with gutta-percha—which is an indispensable step for the success of the operation. As the formalin used in this

formula is obtained in the nascent state, it is necessary that the cavity should be sealed in order to avoid its escape. The dressing is allowed to remain in the cavity for twenty-four hours, and this lapse of time should by no means be extended in the case of deep cavities; in medium-sized cavities the preparation may be left in for forty-eight hours without inconvenience. In superficial cavities two applications are all that is required to obtain perfect anesthesia.

Of course it is always better to first remove all decayed dentin, but this is not an absolute requirement, and if the sensitivity be extreme the application may be made without removing any of the carious dentin, as at a future sitting the débris may be painlessly removed, and as the formol penetrates through the layers of disorganized tissue.

In cases of deep cavities the application should be a short one; if, however, there be the slightest exposure this method is not indicated, as its application fixes the fibrillæ and prevents to a certain extent the action of the arsenic that may be subsequently used for the devitalization and removal of the pulp.

PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, November 1903.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, November 17, 1903, at the Academy of Medicine, 17 West Forty-third street, New York city, with the president, Dr. Hodson, occupying the chair.

The first part of the meeting was occupied with the transaction of routine business.

The paper of the evening was then read by Dr. I. N. BROOMELL, of Philadelphia, as follows:

A REVIEW OF SOME EARLY TEACHINGS REGARDING THE TEETH.

It is the object of this paper to record in condensed form some of the theories which have from time to time obtained regarding the teeth, their structure, development, etc. One of the most interesting features which the writer has observed during the researches necessary in the preparation of the article was that in many instances the very early investigators were more nearly correct in their hypotheses when they discussed or theorized upon the most intricate features of the study, while those conditions which were simple to work upon, involving little or no preparation of tissue or parts, were in the main, in most instances, grossly misunderstood.

For many years and long after the subjects of anatomy and physiology had become distinct studies and fairly well understood, it has been said, the subject of the teeth was little thought of, the early writers regarding this as a matter of little importance, and as a result these

rather curious and deeply interesting phases of anatomy remained for many years without cultivation. This statement, however, is only partly true. It is correct in a sense, so far as actual scientific interest or devoted investigation is concerned, but we doubt very much if other organs received more or perhaps as much consideration from the ancient Greeks and Romans, the poets of India, or the early Hebrew writers, than did these "priceless pearls." In what way are we to judge just how much of any of the great subjects was understood during these very remote periods, when we consider that it is likely that an account of but few of the great revelations which at one time or another convulsed the world have been recorded and handed down to us?

A few instances are on record which lead us to believe that the teeth were equally considered with other animal parts. The recognition of a healthy state of the teeth, together with certain phenomena connected with them, must be credited to the early Hebrews. That the teeth were necessary in the perfection of personal charms and beauty is plain, because it is recorded that Solomon in addressing an illustrious woman possessed of a beautiful set of teeth said, "Your teeth are like a flock of sheep that are shorn which come up from the washing, whereof every one bears twins, and none is barren among them." The loss of the teeth in advanced age was recognized and commented upon by the same prophet, for among other things he said, "The grinders cease because they are

few." "Cundas blossom yields to the whiteness of the teeth; speak but one word, and the rays of thy sparkling teeth will dispel the gloom of my fears," said a poet of India. A Greek poet recommends the following as a sure cure for love: "Make her smile who has bad teeth."

The Greek and Latin poets spoke of the teeth, both natural and artificial. Martial, addressing himself to Lelius, said, "You are not ashamed to purchase teeth and hair, but what will you do for an eye, as there are none to sell?" Macedonius said to an old lady, "What medical art can ever be applied to fasten your teeth?" Martial, who was present, answered by saying, "Cascellius is in the habit of fastening as well as extracting teeth." The father of medicine, Hypocrates, has handed down accounts of many operations upon the teeth, as well, it is said, as accounts of their structure, some of which it is claimed were remarkable in character, but no definite record of these appears to be available. Hypocrates was among the first to pursue the study of anatomy in a practical way, that of paying frequent visits to the burying-grounds of his native city. As a result of this he was enabled to give a very complete description of the bones and teeth, these subjects being among the most complete of his anatomical writings. He recognized the importance of a systematic use of dentifrices, some of which were especially recommended for the purpose of "fixing the teeth." Some of these were rather unusual combinations, as will be seen by the following formula: "Take the head of one hare, three whole mice, the entrails to be removed from but two of these; burn them and reduce them to powder, and thoroughly mix with equal weight of powdered marble."

Erasistratus, a descendant of Hypocrates, was one of the first systematic dissectors known, and if historical records of his work are to be given credence he certainly did his work in a gross way. It is recorded that he cut up no less than seven hundred subjects, and not being content with his work upon the cadaver,

he was accorded the privilege of continuing his studies upon living subjects, selecting any organ or part of condemned criminals which he desired for his purpose.

For a long time a general belief existed among those who deemed the subject worthy of any consideration that the teeth were properly part of the general osseous system, and that while they were shed and otherwise capable of being disarticulated, they were nevertheless developed with and in a manner similar to other bones. Some time prior to the writings of Eustachius, to whom we shall have frequent occasion to refer, a single investigator—who must have been contented as a mere theorist—advanced the idea that the deciduous teeth grew directly from the oral mucous membrane, making them true dermal appendages, but that the succeeding or permanent teeth appeared as true bony processes given off or protruding from the jaw bones beneath.

Number of Teeth.

Dental history records many instances in which in the human subject the number of teeth has been reported as far in excess of the normal, and some writers believe that at one time the number of teeth was normally much in excess of those at present contained in the human jaws. The Italian anatomist, Columbus, positively asserts that one of his children had three rows of teeth at one time, and Maximus and Pliny report cases of like character. A noted physician of Breslau claims to have seen a child of fourteen with seventy-two teeth, thirty-six in each jaw. He was unable to keep the subject under his observation, but was of the belief that this number was considerably increased as the child advanced in years. During the time the child was under his care the seventy-two teeth were remarkably regular in arrangement, being displayed in two distinct rows, the upper rows occluding perfectly with those in the lower jaw. On the other hand, Maximus tells of the son of a King of Bithynia who had a "single bone in each jaw, which took

the place of the teeth," and Bernard Baengha, in examining, at Rome, a number of bones, declared that he found a human mandible containing three distinct dental bodies, one of which occupied the space of the six anterior teeth, and the others filled the molar district on either side. These bore little or no resemblance to the respective teeth, but were in structure apparently normal.

The principal anatomists of the sixteenth century were Massa at Venice, Sylvius at Paris, Vesalius and Fallopius in Italy and Eustachius at Rome. Now let us consider some of the ideas of these early writers, and see how they compare with the modern understanding of the subject; because it is to these that the credit of the first special anatomical investigations should be given. Vesalius studied the eye and the internal ear, while Fallopius and Eustachius furnished the first separate descriptions of the teeth. Up to the time of Fallopius the most vague ideas existed in regard to the development of the teeth, but in the very first report of his investigations he said that "the rudiments of both sets of teeth reside in the human fetus, forming the segments of two circles, the one anterior and the other posterior, the former of which has made its appearance, in doing which each tooth ruptured the membranous envelope in which it had previously been contained." Eustachius was among the first to observe the position and arrangement of the teeth and the period of their eruption, his examinations being upon subjects immediately before birth. He reported finding all the deciduous teeth and the first permanent molars "partly in a gelatinous and partly in an ossified state." In his first dissections he failed to locate the other permanent teeth, and these were most likely destroyed in his eagerness to find the temporary ones, but later on he reported having seen the rudiments of the permanent incisors and canines.

Eustachius made his report in 1653, and shortly after this a French surgeon named Hemard followed with a similar report—adding, however, that he was

"unable to find the great molars at so early a period as birth." If by the great molars we are to understand those of the permanent set the work of this writer was faulty, as the first of these are fully formed in pulp, and partly calcified, in most instances one month before birth. It is true that in some instances, especially in those cases in which the jaws are unusually short, the follicles containing the first permanent molars are not found immediately distal to the deciduous molars, but in such case they will be found in the tubercle of the maxilla or deep down in the ramus of the mandible, the size of the jaw appearing to have little or no influence over the process of tooth-development.

Origin of the Permanent Teeth.

Vesalius and one or two others had an ingenious idea regarding the formation of the permanent teeth. It was to the effect that "The bodies of the permanent teeth are produced from the roots of the temporary" teeth. In support of this doctrine they gave as an illustration the growth of the horns of the stag, these being shed from year to year and replaced by new ones, which they supposed originated from the roots of the old. Fallopius described with some care the presence of "latent seeds" in the jaws which were responsible for the production of the permanent teeth, but offered no theory as to the origin of the deciduous teeth. One Doctor Nesbitt considered the teachings of Eustachius in regard to the presence of the partly developed teeth as imaginary, and he contradicted these by saying, "There is not at birth the least appearance that I can see of a layer or row of teeth." It seems rather remarkable that Nesbitt should condemn the work of so great and so thorough an anatomist as Eustachius appears to have been, simply because he himself, being somewhat less expert in his investigations, was unable to find just what Eustachius so carefully described.

Fitch said as recently as 1820 that while he was perfectly satisfied to accept the teachings of the early writers in re-

gard to the presence of the teeth at birth, or even prior to that time, he was still perfectly ignorant respecting the manner of their formation or connection, and that all ideas respecting the appearance and growth of the teeth were mere conjecture. Berdmore (1770) recognized four dentitions, which he described as follows: First, "the sprouting of the teeth through the gums, which happens sooner or later; the second is in the sixth or seventh year or thereabouts, and produces four great molars; the third dentition happens in the tenth, twelfth, and fourteenth or fifteenth years, and furnishes four other great molars; and the appearance of the third molars is the fourth dentition."

After the investigations and reports to which we have referred as taking place about 1563, little else relating to the teeth appears to be recorded until the time of John Hunter in 1774, when he published what may be considered one of the first scientific books devoted to the teeth ("Natural History of the Human Teeth"). About the same time a number of anatomists began to consider descriptions of the teeth, but for the most part they were so minor in character that they were not to be compared with the more voluminous reports of Hunter. These, however, will be referred to again as we proceed, as will also the beliefs which existed in the sixteenth century.

To show the extent to which Hunter went into the subject it is only necessary to call attention to some of the contents of his book. Beginning with the description of the maxilla, the mouth and its contents, the muscles of mastication, the movements of the jaw, etc., he follows with a description of the structure of the teeth, the enamel and dentin, or "bony part of the teeth" as he calls it. In referring to the pulp-chamber he designates it as the "cavity of the tooth," and dwells at some length upon the nature of its contents, saying that while it is "filled with bloodvessels and perhaps nerves imbedded in a pulp-like substance," the mass differs materially from the marrow of bones in gen-

eral. Reference is made to the pulp as the formative substance. The process of dentinification he calls "ossification of the tooth upon the pulp." While no distinction is made between the cementum and the dentin, a fairly complete description of the membrane between the root and the bone is given. "Of the histology of the enamel and dentin he knew nothing. The hardness of the enamel, its vascularity, and its striated and fibrous appearance when broken, he commented upon, but enamel rods and dentinal tubules he did not look for, and perhaps he would have had difficulty in demonstrating these with the imperfect instruments of his day."

Thus it will be seen that Hunter's work was really the first attempt to fully consider the anatomy and histology of the dental organs, and while in many instances his ideas were correct and perhaps in advance of the time in which he lived, much which he described was quite erroneous, as proved by subsequent and modern investigations. He, together with other writers before him, appeared to be very much confused regarding the character and function of the dental follicle. Of this structure he said, "The external membrane is soft and spongy, without vessels, and the other [meaning the inner] much firmer and extremely vascular." This was contradicted by Blake, who declared that the membranes—referring to the walls of the follicle as we now recognize them—"can easily be separated into two lamellæ, the external of which is spongy and full of vessels, and the internal more tender and delicate and seems to contain no vessels capable of carrying red blood." It now transpires that by careful injection both of these layers are observed to be extremely vascular—in fact, in dissections upon human subjects this vascularity appears as one of the most striking features of the saccular walls.

Nor was Hunter alone in his erroneous belief. Nearly all of the early writers, or those before Blake and Hunter, were of the opinion that this membranous sac (tooth-follicle) was the initial stage of tooth-development; that this was first

formed, and that from its inner wall the tooth-germ or dentinal papilla was given off. Of this process it was said that "after injecting the pulp as well as the membranes from which it is formed [referring to the walls of the follicle], all the parts appear to be extremely vascular." Instead of such being the case, we find that the generation of the follicle is a subsequent process, that it is given off from the base of the primitive pulp or papilla, and that it is not until a very much later period that it envelops the dental germs. From the manner in which the subject was treated in general it would appear that the aggregation of epithelial cells to form the enamel organ was mistaken for the growing follicle—its location, form, and final relationship to the follicle causing such erroneous belief.

To further show that the two structures, the enamel organ and the dental follicle, were confounded and misunderstood it is only necessary to refer to the comment made by Fitch respecting Hunter's declaration in regard to what he termed the "pulpy substance" opposite the tooth-pulp proper. The former, after describing the appearance and location of the follicles for the permanent teeth as observed by dissections made by himself, attempted to strengthen his position by quoting from Hunter as follows: "There is another pulp-substance opposite to that which we have just described"—referring to the pulp proper—"which adheres to the inside of the capsula where the gum is joined to it, and its opposite surface lies in contact with the above-described pulp." Hunter was describing the enamel organ as we now recognize it, and without himself being acquainted with its true nature, while Fitch believed that he was describing the walls of the dental follicle. Fitch dwells at considerable length upon the subject, and the farther he goes into it the more is it evident that he misunderstood Hunter's meaning.

Berdmore was also misinformed in regard to the dental follicle, for he says, "When the gum which covers the alveolar groove of the fetus of the age

above mentioned is stripped off from the bone, small processes or elongations from the inner surface of the gum may be definitely perceived. These are the first appearance of the pulps from which the teeth are formed." From this statement we are led to believe that Berdmore was of the opinion that this entire connective tissue envelope gradually calcified and in this way became the crowns of the teeth.

M. Baumes was among the first to distinguish between the tooth-germs proper and the dental follicle, in describing which he said, "It is in these cavities"—the alveoli—"that long before the completion and eruption of the teeth from the gums may be found an arrangement of little membranous follicles which are supported by minute partitions, and which before the formation of the teeth have the arrangement that these shall ultimately present." "Each follicle has two parts, the one adhering to the lining of the alveolus, the other free, covering over the pulp." While he recognized these structures, he was not informed in regard to their office or their mode of generation, for he says, "It is not easy to discover at what time or in what way these membranous follicles are formed." From his description we are also led to believe that he confused the enamel organ with the walls of the follicle, because, as we have said, he describes one of these as "free, and covering over the pulp."

Continuous Growth of the Teeth.

For a long time it was believed that the teeth were continuous in their growth. Some arguments favoring this were as follows:

John Hunter (1770): "As a proof that the teeth continue growing, it has been said, 'The space of the fallen teeth is always filled up by the increased thickness of the adjoining teeth and lengthening of that which is opposite.'" In combating this theory Hunter said: "That teeth are not actually always growing in breadth must be obvious to any person who considers that in many persons during life the teeth stand so

wide from each other that there are considerable spaces between them, which could not be the case if they were always growing in thickness." He further adds, in considering the third molar, that this tooth "should grow to an enormous size backward, because it has no check from pressure" in this direction.

Berdmore believed that the teeth continued to grow in every direction until about the age of twenty-five, because he says in describing the enamel that it "thickens, hardens, and polishes until the age of twenty-five, and afterward is repaired no longer."

Vitality and Vascularity of the Tooth Tissues.

Hunter, who was always extremely cautious in his investigations, said that the teeth were extraneous bodies with respect to a circulation through their substance, but notwithstanding this he was inclined to favor the idea that they had a living principle by which means they were capable of uniting with any part of a living body. He explained that "A living tooth when transplanted into some living part of an animal will retain its living principle, and the vessels of the animal will communicate with the tooth." He does not attempt to explain how this communication is made, or through what part of the tooth-substance it takes place, but nevertheless this was one of Hunter's many modest deductions, very carefully considered, when it is compared with the opinions of other physiologists of the same time, who made such bold and hasty conclusions in most of their studies as to make them totally unworthy of belief or temporary recognition.

In an edition of Lawrence's translation of Blumenbach's "Comparative Anatomy" we find the following note appended: "The vascularity of the teeth is a doctrine refuted by every circumstance in the structure and formation of these organs. Notwithstanding the fact that Mr. Lawrence was one of the most influential lecturers and writers of his day on physiological subjects, he had evidently misunderstood the character of

the teeth and their organization, and apparently was not willing to investigate for himself or to accept the result of the investigations of others before making such an extraordinary statement as this."

Berdmore offers the following as proof of a circulation in the dentin: "It is well known that a vascular action is more perceivable in young bones than in old ones, but in the bony part of the teeth there is a difference, for in adolescence this substance is of a white color, but in old age it becomes red, as if blood was contained in it." This argument is one that could scarcely be accepted at the present day, for if there be any change in the dentin it is certainly not one which would answer to the description given by this writer.

The results of Hunter's experiments in feeding young animals upon madder had the effect of adding strength to his belief that the bony substance of the teeth received no vascular supply, for each succeeding experiment failed to show the effect of the stain in the dentin already formed. The fact, however, that a distinct red color was present in that part of the tooth in a state of formation at the time the test was applied led him to assert that the teeth must certainly have a living principle. By intermittent feeding with madder he produced alternate zones of white and red in dentin, after which he made the statement that the teeth certainly contain no absorbents, the presence of which would result in the removal of the dye. Hunter does not state how long these experiments were continued in any given case; if we consider, however, the length of time necessary to produce and remove such effects in true bone—a structure similar while yet very different in density from dentin—certainly only prolonged tests could be depended upon. Bell did not agree with Hunter that there were no absorbents in the teeth, but offered the following as proofs that there were: Having under his observation for some time a diseased tooth in and about which there existed considerable inflammation, he finally decided to extract the organ with a desire to study the character of

the internal structure of the tooth after it had passed through such a stage of prolonged inflammation. The tooth was sawn through, and he claims to have found a cavity in the very substance of the dentin communicating with the pulp-cavity proper, and filled with pus. In concluding a description of the case he said, "Here, then, is a case in which suppuration had taken place as a result of severe inflammation, the pressure of the pus occasioning the absorption, and proves the actual existence of absorbent vessels in the teeth."

Near the close of Berdmore's career he made further investigations regarding the vascularity of the tooth tissues, and came to the conclusion that they were provided for a limited period with a circulation, for he says in his report that "The teeth are plentifully supplied with nerves and bloodvessels, which enter through a small hole in the points of the roots and after passing through a straight canal as far as the crown, are divided and diffused all over their substance. This hole lessens as we advance in years, and at last is totally obliterated."

While nearly all the investigators who immediately followed Hunter were inclined to question his belief that the teeth were non-vascular, they evidently did not understand the distribution of the blood within the teeth. In all their descriptions of the distribution of the arteries after they had passed into the interior of the tooth they considered them as being confined to the "internal periosteum"—or the lining membrane of the pulp-cavity—a structure more frequently spoken of, perhaps, than the external or root-membrane. Fox, in his argument against Hunter's views that the teeth were devoid of internal circulation and destitute of a living principle, said, "In cutting off the crown of a tooth in which the caries has not spread to the fang, for the purpose of engrafting a new tooth, I have several times seen a discharge of blood from the internal cavity. This blood comes from the vessels of the membrane in the cavity, which I have also several times seen injected."

Jobson also believed in the existence of a definite membrane lining the pulp-cavity, the principal function of which was that of supporting the bloodvessels and nerves "before entering the osseous structure of the teeth."

While considerable attention was given to the subject of the vascularity of the teeth by the early writers, little was said regarding the sensitivity or the nerve distribution to the organs, other than that nerves entered the teeth. Hunter was among the first to discuss this subject, and in fact about the only one to consider the matter. As might be expected, his views in this respect corresponded to those expressed in regard to a circulation in the teeth. In commenting upon the subject he said, "We may presume that the bony substance itself is not capable of conveying sensation to the mind, because it is worn down in mastication, and occasionally worked upon by the operator in living bodies, without giving any sensation of pain in the part itself." In addition to this he says, "In the cavity of a tooth it is well known there is exquisite sensibility; and it is likewise believed that this is owing to the nerve in this cavity. This nerve would seem to be more sensible than nerves are in common, as we do not observe the same violent effects from any other nerve in the body being exposed either by wound or sore as we do from the exposure of the nerve of a tooth."

Generation and Physical Characteristics of the Tooth Tissues.

Enamel. While the early writers appear to have been fairly well informed in regard to the dentin, recognizing it to be essentially a bone-like structure, their understanding of enamel was not nearly so complete. Many opinions existed in regard to this structure, as to its location, its hardness, its formation, and its histologic character. Before the appearance of Bichat's "General Anatomy," which was about 1780, it was generally believed that the roots of the teeth as well as the pulp-cavities were covered with a layer of enamel the thickness of which was quite variable in different

cases. It was contended that this enamel covering and lining to the teeth was an essential condition, externally to limit the growth of the organ, and internally "to maintain the diameter of the canal nearly in the same state." Bichat contradicted this theory, and was about the first to describe the enamel as being confined to the external surface of the crown only.

In regard to the structure of the enamel, M. Baumes in 1783 said: "Although it is easy to perceive that the enamel is something different from the bone, it is not easy to discover its true nature." About the same time, M. Josse, after extensive physical and chemical examination of the teeth, concluded that the enamel was an oxalate of lime, reaching this conclusion after comparing it with urinary calculi. This belief he was soon compelled to abandon, and finally concluded that both the enamel and dentin of the teeth were a true calcareous phosphate. Considerable thought was given to the hardness of the enamel and many experiments made to demonstrate that this varied considerably in different subjects.

Berdmore (1770) tested the quality of tooth-enamel by subjecting the surface of extracted teeth to the friction of tooth-powders sold during his time. He reports: "That the powders which are usually sold for cleaning the teeth do in some measure hurt the enamel is too obvious to need any argument, but it is not generally believed that they are so pernicious as to deserve particular notice or censure. I thought, therefore, that it would not be improper to put this matter to the test, and, to ascertain as clearly as possible in what time or how far they are or are not destructive, I fastened in a vice a sound and well-enameled human tooth, placing the convex side uppermost. I then took a brush wetted and charged with a certain tooth-powder, which I had bought for the purpose, and in less than an hour, by rubbing quickly with this brush and powder I wore away entirely the enamel of the part which was exposed to their action. The like experiment I repeated with all

the different tooth-powders, and found the same effects, varied only a little in time according to the coarseness or fineness of the powder, and the *different hardness* of the enamel. Now, it is well known that a number of people brush their teeth with powders of this kind two or three times a week, and if I allow that the brush and powder generally act on the front teeth briskly for one-fourth of a minute each time, in the space of a month they act three minutes, or in two years seventy-two minutes; that is to say, in the space of two years the teeth have undergone a great deal more brushing than was found sufficient to destroy the finest and best enamel. Hence those who brush with powders only once a week do not destroy the enamel in less than five or six years, and those who use powders but rarely can never be brought to believe that their teeth are injured by them, because the destruction creeps on too slowly to be observed."

Many tests were made to determine the quality of tooth-enamel in different teeth by subjecting them to heat, the structure that withstood the greatest amount of this without breaking down being considered the hardest in quality.

In considering the subject of the formation of enamel, as well as that of dentin, the early writers failed to recognize the importance of cell life and cell activity in connection with this process. Nowhere do we find recorded the presence of cells as essential to the secretion or excretion of the lime salts for the upbuilding of these tissues; but instead of this we are led to believe that the bloodvessels alone were considered as the active agents in this process.

Jobson said, in considering the formation of enamel, "—although it is totally unknown by what mysterious arrangement it happens that these arteries which formerly deposited an osseous structure should now create a matter so different as this vitreous and crystalline substance is." From this quotation we are given to understand that this writer believed that the dentin was deposited directly from the arteries which permeated the dentin germ, and that the

same arteries later on were so changed or specialized in their distribution that they in a similar manner deposited the enamel. The same writer in describing the act of enamel deposition said that "When the ossification of the pulp is complete, all traces of its interior membrane appear to be lost. About the same time a peculiar action seems to take place in the vessels of the inner layer of the capsule, and a greenish colored, chalk-looking powder is deposited in successive layers, which rapidly unite into a very hard crystalline substance, the enamel of the teeth." This writer evidently believed that the dentin was fully formed before the process of enamel formation was begun.

Berdmore was among the first to observe the presence of a specialized layer within the tooth-follicle the function of which was the secretion of the enamel. He says, "It"—the enamel—"is formed by the membrane which invests the pulp. When a shell of bone has been formed upon the pulp, this membrane secretes the fluid from which a very white soft substance is deposited upon the bone. This at first is of a consistence not harder than chalk, for it may be scraped off by the nail. It soon, however, grows hard, and seems to undergo a process similar to that of crystallization, for it takes a regular and peculiar form."

M. Delabarre contended that the enamel is an integral part of the teeth, that it proceeds from the dental embryo and is produced by an immense number of small exhalent vessels which form a sort of imperceptible velvet. Into this he supposed the calcareous ingredients were deposited, and in such a way as not to destroy their organic sensibility.

Goodsir also spoke of a gelatinous granular substance being present between the wall of the follicle and the germ of the tooth proper, and considered that this was the organ destined for the formation of enamel, but in his description, as well as in that of Berdmore and others, no reference was made to the presence of specialized cells essential to the process. Fitch was about the first to suggest that the process of enamel

formation was by the calcification of certain specialized cells, because he says that "the enamel is exactly of the shape and figure of the membranes and cells from which it is formed."

Continuous Growth of Enamel.

For a long time there existed considerable speculation in regard to the growth of enamel—whether it was a process completed at a certain period or whether it was continuous. Many of the early physiologists believed that the process of enamel formation was continuous, but they attempted to make no explanation as to how such a process could be kept up. Berdmore, after describing the methods which he employed to see that enamel could be readily worn away by the use of tooth-powders, continues by saying, "To all this I presume it would be objected that the enamel is *known to increase in thickness* from childhood to puberty, although some part of the original growth is certainly worn away in the meantime; and since it evidently appears from this to admit of growth and repair, it may do so likewise at some advanced age and supply whatever is lost by the use of tooth-powders. It may be added, too, that although it seldom or never is restored in a part where it has once been totally separated from the bone, yet it may, like the bark of trees, receive new layers and be repaired so long as any part of the internal substance remains unhurt."

Formation of Dentin.

The early writers in considering the subject of dentin formation were much confused, and offered many theories in regard to the manner in which this took place. Here again, as in the formation of enamel, the presence of specialized cells for the purpose was not considered. They were evidently inclined to believe that the formation of dentin—or the bony part of the tooth, as they continuously called it—was similar to that of the formation of the subperiosteal bone-development.

Fitch was of the opinion that the deposit of the bone of the teeth was by

different strata one inside the other. He also believed that these concentric lamellæ were plainly visible. Evidently his examinations had been confined to that part of the root which we now term cementum, a structure which he did not recognize nor consider as different from the body of the tooth. He recognized an internal periosteum, as he termed it, which was present upon the surface of the pulp, and that it was from this that the successive layers of dentin were deposited. He also evidently considered that the process of dentin formation ceased at a certain period, because he says that "After the tooth is fully formed, the membrane of the pulp remains as a permanent lining to the cavity."

Bell, in referring to the subject of dentinification, said, "The ossific matter is secreted not from the pulp itself, but from an extremely delicate vascular membrane which covers its surface and is closely attached to it by vessels." This membrane, which he termed the proper membrane of the pulp, he considered as being a propagation of the periosteum of the jaw.

M. Baumes, in speculating upon the generation of tooth tissues, makes no attempt to describe the process of calcification, but contents himself by saying, "The pulp of the tooth is the first part formed, and is at first the most considerable portion of the structure. It appears that the bony part forms next, and then the enamel forms upon the outside of this."

Berdmore was among the first to consider that the pulp of the teeth was gradually formed into dentin by calcification of this substance. He says, "The bony part increases in thickness, and further examination leads us to believe that it is formed by successive layers of matter thrown out from the pulp."

All of these writers seem to recognize the fact that the process of dentin-growth was a continuous one, but they did not all agree with the idea that this was at the expense of the pulp-cavity—for, as we have seen, some thought this space to be lined with enamel which pre-

vented a further growth of dentin in that direction, while others considered this to be controlled by a distinct internal lining of periosteum. Jobson claimed that by the forty-fifth year there were rarely any traces of the pulp remaining, while another writer ventured the following assertion in regard to the roots of teeth whose crowns had been excised or lost from disease: "The openings by which the minute canals terminate in a given cavity become, soon after excision of the crown, plugged up with bony matter, which thus forms a permanent protection to the interior of the stump."

Strange as it may seem, none of the writers whom we have quoted recognized the presence of a special tissue covering the roots of the teeth. M. Baumes (1783) said, "Thus the teeth are formed by two substances, the one analogous to the bones, the structure of which is condensed much like that which constitutes the petrous portion of the temporal bone, and the other harder and more compact still, which is called enamel." In describing the roots of the teeth, Berdmore said, "The roots of the teeth consist of one uniform substance," and Jobson in his description practically makes the same assertion. As recently as 1830, Thomas Bell, in his admirable work, recognized but two hard tooth tissues, for he says, "There are two distinct substances which enter into the composition of the teeth, essentially different from each other in structure as well as in chemical composition, the one being organized and the other crystallized."

Discussion.

Dr. TRACY. We have something to be proud of when we compare the status of the profession in the past with that of the present, and the advances that have been made should make us thankful for the efforts expended and the energy put forth. Many of us do not reflect on the great strides that have been made on the theoretical side of dentistry, and for that reason we are greatly indebted to Dr. Broomell for his interesting essay.

Dr. HART. I desire to express my

gratitude to Dr. Broomell for the research he has made in the chronological tabulation of these portions of dental history. It certainly makes it easier for those of us who want to study such history to have this information, which has been found only after much digging and delving, and to get it in such a form that we can readily find out what was done by our dental forefathers.

While with our present light it seems as though some of the theories that possessed the dental mind originally were ridiculous, I think the scientists who were working in other fields were probably no more advanced in their specialties than the men who were working out the dental problem.

Dr. STARR. It does not seem to me that this paper can call for much discussion. It is a chronological history of events, which has been very thoroughly gone into by Dr. Broomell. We owe him a debt of gratitude for having compiled this research into the history of our knowledge of the origin and development of the dental organs. We would have been still more indebted to him if he had gone farther, and given us some of his own ideas in regard to the anatomy and development of the teeth, with which we know he is very familiar.

Adjournment.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

Annual Union Meeting, Baltimore, May 1903.

(Continued from page 57.)

SATURDAY.—*Morning Session.*

THE meeting was called to order at 10 o'clock Saturday morning by Dr. Davis.

Dr. W. G. FOSTER, Baltimore, read a paper on "Dental Education," as follows:

DENTAL EDUCATION.

One need feel the assurance of patience on the part of those addressed, when "dental education" is presented for your consideration. This intricate subject has been so frequently and ably discussed by men who have devoted considerable time and thought to the questions involved, that seemingly all the important points have received such attention from various writers as to render any further consideration superfluous. If all writers agreed this would be so, but the differences of opinion are so marked that if a few suggestions were submitted for consideration other than those which

seem to have the greater following among the many, it might call attention and might direct controversy to some important factors in the solution of this question.

The first question in order, and one upon which a considerable diversity of opinion exists, is the sufficiency of the preliminary education. If the accepted standard adopted by the National Association of Dental Faculties, that "the minimum preliminary educational requirement of colleges of this association, beginning with the session of 1902-03, shall be a certificate of entrance into the third year of a high school, or its *equivalent*, the preliminary examination to be placed in the hands of the state superintendent of public instruction"—is this sufficient qualification or not? This rule was adopted as the best among a number offered, it not being deemed best at that time to advance the standard reading

"to one graduated from a high school," for reasons thought to be sufficiently strong and convincing.

Now let us question ourselves how far the requirements can be advanced without detriment to those seeking an entrance into the dental profession. If the National Association of Dental Faculties should advance the standard admittance to sessions for 1904-05 to read, "shall be graduates of a high school or its equivalent," for the requirement of schools of this association, those presenting themselves for admittance to our schools would be on an average twenty-one years of age; the four years' course which has been adopted for 1904-05 would make the candidate for graduation twenty-five years of age—half of the average life of man. Taking into consideration the two years, or more, usually the time required for one to acquire a paying practice, how much time remains for one to acquire a sufficiency of this world's belongings to render one free from the unhappy reflection that possibly one may constitute oneself a charity patient in some hospital endowed for such purposes. Those of you who are advocating a higher standard than a completed high-school course are trying to make requirements that are certainly unnecessary for a dental education, and of no possible advantage in the completion of a professional education largely partaking of finger culture or manipulative ability. In support of this opinion I beg leave to read you the opinions of several eminent college professors as follows:

THE SHORTER COLLEGE COURSE.

Harvard now grants the degree of A.B. at the end of three years to students who have by "doubling up" or by attending vacation school done the work required for a four years' course. President Butler of Columbia advises accepting a two years' course from those who enter the school of law or medicine, requiring four years only from candidates in philosophy.

College presidents generally oppose granting the bachelor's degree to short-course graduates. Yet the condition for which Drs. Eliot and Butler are prescribing does demand a cure. Entering primary school at six years of age, high school at fourteen, and college at eighteen, the student graduates at twenty-two and is twenty-five before he has finished

his professional course. Illness or other loss of time often delays graduation from professional school until one is twenty-eight or thirty years. This is a loss of the young man's best years, to himself and to the community.

Many educators say that the trouble is not with the colleges but with the lower schools. Dr. Munsterberg of Harvard modestly states that when he graduated from a German gymnasium at eighteen he was about equal in scholarship to "a Harvard senior or a Dartmouth graduate," and quite ready for university work. According to him a doctor "hangs out his shingle" three years earlier in Germany than in the United States, but he is able to do so because all his teachers, even in childhood, are university men, specialists and enthusiasts in their subjects. President Hadley of Yale, in addressing the New England Association of Preparatory Schools recently, sensibly suggested that time might be saved by providing different courses in high schools for those who are and those who are not to go on to college.

No one doubts that a school life of twenty years is too long a preparation for ordinary professional life; the question is, where the cutting shall be done. Dr. Eliot and Dr. Butler are entitled to credit for undertaking to do something where others merely agree that something ought to be done.

It would be rather presumptuous to predict that in the near future didactic teaching would be removed from the curriculum of the best-regulated schools; yet it is ventured in this paper. The only methods which will obtain and prevail will be in the form of manual directions and practical demonstration, with sufficient theory for the existing conditions and the future possibilities. Would it not be the better course to more rigidly exact the present requirements than to experiment with others untried?

Students have been known to take the examinations, pass, and sell their papers to those less qualified or not qualified at all. The more exacting examination of papers would obviate this difficulty. The learned or "book" man is not always the best professional man. The man whose education will allow him to pass a more exacting examination is no better student in dentistry, excepting in the theory, than one much below him in literary attainments. The synoptic tables show that the prize men in theory are not the prize men in practice. You would prefer spending a social evening with the

theory man, but you would place yourself and family in the hands of the practical man, knowing the attainments of each.

I hear a mental criticism from someone present, to this effect: "But the dignity of the profession must be maintained; we cannot afford to have requirements less than other schools of like character." That is just the question. Do you class a college or university teaching medicine *alone* as "of like character"? Do you class a university or college teaching law or theology as of like character? I think you will admit their dissimilarity. The preliminary requirements of the latter should be higher because of the mental training which aids and develops the intellect not only at the present time, but progresses as long as the brain remains intact; while in schools of dentistry, dentistry alone is taught, with didactic lectures on pathology, therapeutics, chemistry, oral surgery, prosthetic dentistry, bacteriology, and kindred subjects relating to the diseases of the oral cavity, the relations of impaired digestion to the teeth, and such diseases as are connected with and are due to reflex action from a disarranged condition in the oral cavity. Therefore, I hold that the preliminary requirements are not necessarily as exacting in the one case as in the other.

The important step in the preliminary examinations for students in dentistry is to so fix the standard that we will be able to maintain it, and not constantly be remodeling and re-enacting clauses; to be sure of our premises before we enact such laws as would prove harmful to those about to enter the profession of dentistry. If the preliminary examinations were so arranged as to be unalterable, or at least to be so for a number of years, it would obviate the first difficulty we have to encounter.

We would ask your attention to the methods of teaching. This question is being discussed in our associations and in the leading dental journals; and here again we have quite a diversity of opinions, some contending that mixed schools, as they are termed—meaning by

this those schools of medicine which have a dental department—are better able to impart to the student a fuller course than schools which are devoting the greater time to teaching dentistry. Now, to enter this discussion would only provoke a less amiable controversy than is necessary, but it is not important. The only question at issue is, Is there too much of medicine taught in one and too little in the other, or is there too much dentistry taught in one and too little in the other?

In the avoidance of this question I can do no better, perhaps, than quote from an editorial in the *Dental Brief*: "Theories and hypotheses to the contrary notwithstanding, the pregnant fact remains that the greater part of original scientific work of the past half-century has been accomplished by those to whom the stimulus to research came as a result of their application to their duties as teachers in dental schools. In fact, the potential possibilities of advancement in specialized science are always greater when its general principles are studied from the standpoint of specialty by the specialist, rather than from that of general science by one unmindful or ignorant of those collateral applications of general principles which are dominant and directing agencies in the advancement of special research and the attainment of specialized knowledge. Hence it follows that whatever be the collegiate relations or corporate organization of dental schools or departments, other things being equal, the greater the proportion of *dentists* in its teaching force, the better for the school, the teacher, the student, and the profession."

You can formulate rules as to what branches are most important to be taught, but you cannot formulate rules as to methods of teaching. That is a question of individuality alone, and each school is better able to judge this question than those who have no experience in teaching. Now let us glance at the requirements for graduation of students in reputable schools. After a satisfactory preliminary examination, the studies assigned to the freshman class comprise

anatomy, physiology, chemistry, dental materia medica, didactic and practical operative and mechanical dentistry, pathology, and therapeutics. The course of studies for the junior term comprises a review of the freshman studies, with histology, dissection, and general surgical anatomy added. In the senior year the preceding studies will be continued, with the addition of surgery and bacteriology. Each candidate for graduation must present himself or herself for examination before the faculties upon all the subjects taught in this school. Prior to such examinations the student must show specimens of operations upon the natural organs and present approved specimens of dental mechanism constructed in the college, also must have attended three full winter courses of lectures—and after this session, four—in the above institution. Now, it would seem that these requirements are sufficient if they are strictly carried out, and if the faculties are honest in their efforts to impart this instruction and in their final decision. And why should they be less honest than those who criticize? There are a few, I regret to say, in our profession who have cast a shadow of doubt as to the fulfilment of these examinations. I am rejoiced that there are but a small number so thinking. There are a majority of the faculties in favor, and strongly so, of having the examinations conducted by men not connected with the faculty, but so far our efforts in this direction have proved futile. I for one am earnestly in favor of this position. The difficulty is in obtaining men of ability willing to devote the time necessary for these examinations.

After all is said, is it not a question of proficiency altogether? All men are not equal in mental capacity, nor are they so in mechanical ability. I for one am utterly opposed to the present practice of requiring all to conform to the rules laid down by the schools. I cannot understand why, or for what good reason, should a student apply for entrance into the junior or senior class and on examination prove his ability to enter either

class, as the case might be—that he should be required to enter the freshman class. It is an injustice to the man's attainments, I care not where he may have acquired this knowledge; that ought not to be the question, but, Is he prepared? If so, why not enter him where he properly belongs, and give him the credit he deserves for his proficiency?

Now, understand my position: I am in favor of as high a standard of educational requirements as is consistent with the thorough acquirement of a completed course in dentistry. I am in favor of those studies and demonstrations which instruct a student how to set a broken jaw or how to treat a cleft palate, and opposed to those studies which instruct him in the best methods of reducing a fracture of the leg or arm. The first-mentioned belong to dentistry proper, and the latter to general surgery. I am as firmly of the opinion that a dentist is more capable in either of the former operations as I am that the general surgeon is more capable in the latter cases. I am in favor of such restrictions as will prevent incompetent students from applying for entrance to our schools; I am in favor of the most advanced teaching which will inculcate in the student a desire and hunger for those conditions which not only fit him thoroughly for his professional duties, but the equally important factors which teach him under all conditions, and all surroundings, to be a gentleman.

Discussion.

Dr. L. ASHLEY FAUGHT, Philadelphia. Some years ago I was more in touch than at present with the working phase of the subject that has been brought before us. I have always been an advocate and in favor of maintaining a high preliminary or entrance examination education. I am in favor of the student being the best possibly educated up to a certain point before entering these schools to fit him for his life-work and professional services. As to what that preparation shall consist of, I would say that I have always advocated that it should not be less than entrance to the

college course. A dentist entering upon practice with less education than this would always find more or less a lack from not having this preliminary training before entering upon professional study. He cannot acquire those branches as thoroughly, and be as well fitted for professional life, as if allowed to take them in early life, when the mind is developing.

Dr. LIBBEY, Pittsburg. There is one thought that came to my mind as I was listening to the paper, and I cannot help but call attention to that point on the educational question. That is, we have a great many schools over the country, and it seems that every year the classes are increasing, as well as the educational requirements, and there is one thing that seems to me to be neglected in the way of examination—that is neglected at least during the first school year; that is, the studying of the qualifications of each man in order to see whether he is fitted for the profession, and, if not, showing him that he has started on the wrong line, and trying to help him to select the line for which he is fitted. This would no doubt be better than letting him go on and take a three or four years' course of training, and after one, two, or three years' practice for him to find out that he is unfitted for the work he is trying to do. This could be done by the professors in the colleges studying the qualifications of each man, and by examination at the end of the first year seeing whether he is qualified for the particular branch he has selected; if he be not, advising him in another direction.

Dr. W. A. MILLS, Baltimore. When men talk about its not being necessary to have any knowledge of medicine in order to practice dentistry, I feel that we must be going backward. I am in favor of all sorts of education that may have any relation to dental surgery, for a dentist will need all he can get in the practice of his profession. Men who come out of college with the feeling that they have just begun their education are the men who succeed in their life's work. When a man feels after leaving college

that he has learned all there is to be known he will not be a success, for it will take continual study to keep up with the rapid advancement of the different specialties. I claim that I am a better practitioner for having tried to keep up with the times by reading and studying books, not only of my own profession, but those of medicine, to keep myself posted. When I learned to fill a tooth in a prescribed manner, I did not have to study up on that the second time, because that was strictly a mechanical operation, but when I come to deal with diseased teeth and diseased conditions of the soft membranes, or reflex conditions, then it is that my medical knowledge comes into play.

The time is coming when men who claim that all that is necessary for the practice of dentistry is prosthetic knowledge, no medical or scientific knowledge being required, will be in a class to do only the mechanical part of the work, and therefore cannot claim to be professional men. The stomatologist will be the man to treat all the diseases of the mouth and contiguous structures. He will have the M.D. degree, and dental surgery or stomatology will stand in the same relation to medicine as ophthalmology, gynecology, etc.

Dr. FOSTER (closing the discussion). I have very little to say in closing. I hope that I have not created the impression that I am against education. With regard to what Dr. Mills says as to the dentist's knowledge of medicine, it is very well to have this, but it is not necessary, and we seldom have use for it. I have great respect for Dr. Mills, both as a man and a dentist, and when it comes to filling teeth, reducing fractures of the jaw, or anything that comes under the scope of the dentist, I should be pleased to have Dr. Mills do what was necessary, but when it comes to his medical knowledge as a dentist, I would beg to be excused.

On motion the subject was passed, and Dr. R. W. SIMON, Baltimore, read a paper on "Acoin as a Local Anesthetic" (printed in full in the January issue of the COSMOS, at page 19).

Discussion.

Dr. R. O. SADLER, Baltimore. This is an entirely new remedy to me. We are all looking for something that will give us satisfactory anesthetic results without the bad effects. I have used cocain in various forms and combinations for a great many years, and while I have never had any serious results, I have seen some cases in which I was sorry that I used it. I am very glad to have heard the paper, and I think it entirely worthy of our attention and consideration.

Dr. E. A. BRYANT, Washington, D. C. We want to be very careful in the use of these preparations. The one which Dr. Simon presents is no doubt a good one, but we should be careful in using it. In the case he shows there is very little swelling. This has been my experience with very few preparations. After the doctor has used this in his practice for a year or so, and is able to give us practical results of his experience, then no doubt we can all derive benefit from its use, if found satisfactory.

Dr. W. A. MILLS, Baltimore. I had a patient suffering from cocain poisoning, following its injection for the painless extraction of teeth. The inside of the cheek as well as the gums where the teeth were extracted seemed to have been affected with a condition similar to that of eczema. I gave him a prescription for hydrogen dioxid to be used occasionally, full strength, as a wash. I never saw the patient again until about twelve months afterward, and I asked him about his mouth. He said he had had no trouble after using the prescription. He said the trouble passed off, and has not since returned.

Dr. M. F. FINLEY, Washington. I would also thank Dr. Simon for bringing this preparation to our attention, and especially for one remark made in regard to its use, and that is in pulp-extirpation. To those who prefer to remove pulps without the use of arsenic it seems to me an invaluable remedy, and in that case there would be no danger of sloughing as in using cocain. To my mind, from his statement of the case it is much more easily used,

and the effects obtained without any special care. In the application of cocain we must wait considerable time for the effect, and I think this a very valuable remedy in these cases if we can get comparatively immediate effects from its application.

Dr. SIMON (closing the discussion). I have used this preparation for about a year, and have never had any ill effects from its use. The case which I passed around is a fair example of the conditions after its use. I have never experienced any of the effects that usually follow the use of cocain preparations.

On motion the subject was passed, and Dr. RICHARD GRADY, Annapolis, Md., read the following paper:

ORAL HYGIENE FOR THE SCHOOL BOY AND GIRL.*

"The tooth-brush is mightier than the dentist." It grieves me when I see a subject of such vital importance as oral hygiene so little appreciated by those in control as to find barely room on a program extending through a three days' session. The profession was never so much alive as it is today to the necessity for carefulness in matters of hygiene. It is defined as "the science of health, personal and general, individual and common, and the study of the environments of man in relation to their influence on health."

The subject of oral hygiene is a very far-reaching one, intimately connected as it is with bacteriology, pathology, and surgery of the mouth and teeth, and, considering the gravity of some of the systemic conditions that may be associated with oral sepsis, it has a very important bearing on health.

An English writer recently pointed out very strikingly the importance of oral hygiene, especially with regard to

*Dr. Grady made some opening remarks in which he said that he had intended to submit for criticism a leaflet or tract of about four pages on oral hygiene for school boys and girls, with illustrations showing the kind of tooth-brush to use, how to use it and how not to use it; but that he had been disappointed in securing the illustrations.

operative surgery, and his words may be quoted with advantage: "I am convinced that a septic condition of the mouth, tolerated in ordinary health, may become a source of great danger to the patient during an acute specific illness, such as typhoid fever, ulcerative endocarditis, or pneumonia, and may be an important factor in the issue of the case. It has been remarked that severe abdominal operations successfully performed, in which the local results are satisfactory, are sometimes followed by indications of blood-poisoning, parotitis, and death. The inflammation and rapid sloughing of the parotid gland are apparently not due to the effects of the operation, but to the condition of the mouth and teeth. It follows, therefore, that the mouth of the patient should be clean, as well as that of the surgeon and the nurse, in order to insure the best results in operative surgery."

A distinguished specialist asserts (says Dr. W. D. Miller) that "loss of appetite, nausea, and general ill health may be brought about by want of proper attention to the mouth, causing a chronic state of putrefaction, the products of which are absorbed by the mucous membrane with serious results to the general health. The examination of 987 children demonstrated that 99 per cent. of all those suffering from caries of the teeth were affected with putrefaction and swelling of lower glands of which no physician would be able to make a diagnosis."

What do dentists at home say on the subject. Let me quote the personal testimony of a few, as our ideals:

Dr. L. Ashley Faught, in expressing his belief that clean teeth mean tooth-salvation, said at our last meeting, "Fifteen years ago two creeds were before the profession—(1) Failure in operations is mainly due to defective manipulation; and (2) Failure in operations is mainly due to incompatibility of filling material with tooth-bone. I then enunciated a third creed: Failure in operations and tooth-loss are mainly due to the lack of oral hygiene. Added years of observation and service have in every way more

firmly impressed its truth upon my mind. It is the keynote of tooth-salvation. Clearly the work of the patient is oral hygiene—the maintenance of the oral cavity in a state of health. The work of the dentist is dental prophylaxis—the placing of the teeth in condition to prevent disease, a state favorable to oral hygiene. Thus it appears from any strict definition of the two words that the end to be obtained by either dentist or patient is one and the same—prevention of disease, maintenance of health."

Dr. Guilford says: "I think the dentist of the future will rely upon prophylaxis more than in the past. My own experience and recommendation is to brush the teeth after breakfast, after dinner, and after supper faithfully with an alkaline substance—it does not matter what. There is not one-half or one-third of the caries in a mouth thus treated that you would ordinarily find."

Dr. Trueman: "I am of the opinion, and have been all along, that prophylaxis is to be the main object in the future of dentistry. It won't put money in our pockets, but it will put health and comfort in the mouths of our patients."

Dr. Stiff: "The nineteenth century gave birth to and saw the great development of dentistry along operative and mechanical lines. I have faith to believe that the twentieth century will be noted in the history of our profession for the growth and full development of preventive dentistry."

Dr. Hoffer: "If some good dentist would take it upon himself to write a small book about the care of the teeth and then let the dentists throughout the country recommend its use in the schools, some good will be accomplished in teaching oral hygiene. 'Some Thoughts on the Prevention of Caries' should be read before mothers' clubs instead of dental societies, and it should be published where the greatest number of the laity could read it. Such articles should be printed in the daily papers, and there would be less need of so-called beauty hints as to the care of pimples and facial blemishes."

Dr. School told his lady patients that "if they would take as much pains in keeping their teeth clean as they do in taking care of their hair they would have very few decayed teeth."

Dr. Corley: "It is amazing that men will be surprised, and women angry, if you try to convince them that their mouths are unclean. We may say that the majority of patients think that neglect means only the possibility of the expense and discomfort of a dental operation. They think, further, that after a tooth has been properly filled it will never again decay; consequently they feel that, when they pay their bill, their whole duty has been discharged. As soon as we recognize the importance of compulsory oral hygiene, the better off we and our patients will be."

Is it right that the vast research respecting the hygiene of the mouth and the control of dental disease should go for nothing in education?—that this wealth of knowledge should be passed by as if it had no existence, and the young people of the country grow up as ignorant of it as if they had lived centuries ago?

Oral hygiene for the school boy and girl is a question which may well engage the attention of dental organizations. The teeth of a child may be compared to a young tree. Their beauty and position depend largely upon the care bestowed upon them during childhood.

It is the noble privilege of the teachers of the country to promote in some degree the preservation of the teeth of those under their care; and this they can do by inculcating early and earnestly and with the emphasis of a high religious duty the principles of oral hygiene. We want children instructed in the care of the mouth and teeth, in cleansing the whole mouth, including the tongue, and the sooner this is done the sooner will the many evils arising from the present neglect be stayed. Children must be taught some system of oral hygiene. The teaching which a growing child imbibes in school sticks fastest in its memory. Young minds are very susceptible, and they would readily understand the

situation, especially if told the calamities liable to follow the neglect of their teeth and mouths. The teacher should be competent to instruct in oral hygiene, and the condition of children's teeth might be given recognition on the deportment card, thereby offering an indirect reward to both child and parents. Make the children feel the importance of their co-operation in the care of their teeth, and they will be more impressed.

Oral hygiene is a subject in which all mankind has an interest, even though it be, as it too often is, an unconscious interest. The life of every man, woman, and child ought to be guided and governed by its laws. This being so, the subject should be presented and agitated in many forms until its importance is appreciated. If we can persuade people to take proper care of their mouths we are doing a wholesome service to them and their friends as well as a kindness to all who come within conversing distance of their breath. It is true that few teeth under constant and intelligent care will decay, and that still fewer need ever be lost. Therefore the practice of oral hygiene is more prophylactic, in its true analysis, than any other preventive procedure.

School life and conditions regarding caries are at their worst in our great cities, and require urgent amendment. The children are affected by the confinement of the schoolroom. The inculcation of cleanly oral habits among children should be insisted upon. The hope of dentistry is to employ prophylactics instead of remedies, to prevent decay instead of treating it. It is essential that a child be taught how to brush the teeth properly. The course to pursue in dealing with this question is by persistently and intelligently educating the mind of the public as to its exact status, and whatever we wish to see introduced into the life of a nation, we must remember, must first be introduced into its schools. The school is the one force to unify all conditions of society. Here we have the children of the nation, and we can, if permitted, teach them that soundness of teeth is in itself one of the

best evidences of general soundness of body; that the care of the teeth pays in comfort, in beauty, in the conservation of health; that the care of the teeth and gums tells of inborn politeness, and sustains association with well-bred men and women.

When I thought to write on oral hygiene, the apparent apathy in the ranks of the profession led me to stretch my thoughts beyond the limits of my topic—oral hygiene for school boys and girls. The most alarming feature of the situation is the indifference of the organized profession in state and local societies, all of which are not co-operating with the efforts of the National Dental Association, which has taken efficient steps in the right direction.

In conclusion, may I ask, Are dentists content to live for the day, and for themselves, and for the spirit of dentistry to be set forth in expressions like the following, uttered by dentists?—"I guess we don't need anyone to teach us to clean teeth." "Dr. — has a great craze for cleaning teeth, but I don't approve of it; it will polish away the enamel of the teeth." "The cleaning of teeth once a month is all tommyrot." "Yes, this is all right, but if I adopt this system and stop decay, what am I going to do?"—a spirit wholly antagonistic to the instincts of true professionalism.

Shall we not rather be far-sighted, and look to the future; and philanthropic, and aid to uplift and help our kind regardless of our aggrandizement? To do our work best we must be preventive dentists. The situation is well worth our most careful attention. We must so educate the public that mothers of future generations will know that scrupulous care of their children's teeth is necessary, not only to save the teeth but to insure good general health. The best place for us to do this work—and we are the ones to do it—is the school-room. Get into the text-book on physiology (if only in the form of a leaflet or tract) what we want the children taught in oral hygiene, and half the work will have been accomplished. This will

be difficult; it will take time, money, and much work; but nothing we have ever done will be so beneficial to the people. This movement is crystallized into shape in the work of the National Dental Association, and began, as you know, with the children in the schools. It is a wholesome move, and coming from the fountainhead will accomplish much in securing data with which to impress school authorities and the public. It is sufficient to say that the action of the National Dental Association has stimulated the movement throughout the country.

Discussion.

Dr. W. A. MILLS, Baltimore. I think the profession owes a great debt of gratitude to Dr. Grady for his persistent work along this line. I heartily agree with everything he has said in the paper, with one exception, and that is his method of brushing the gums. In my system of brushing the teeth and massaging the cheeks as well as the gums, I have been working out successfully a problem, but doing it empirically. I was pleased to hear Dr. Kirk speak yesterday of vitiated saliva. I have all along been instructing my patients to clean the gums and tongue as well as the teeth. The value of these instructions is borne out in the improved condition of my patients' mouths. In the case of my own wife, I have never had to fill a new decay for her in the last ten years; and it is the same with seventy-five per cent. of my patients, where they follow instructions. In such cases recurrence scarcely ever occurs.

Another point, which I did not intend to speak of just at this time before writing it up, is, that you cannot tell how far-reaching may be the good effect on the general system produced by clean and healthy oral cavities. I can call to mind three or four lady patients who have been married for years and have never borne any children. Their mouths were all in more or less diseased condition, but after I succeeded in getting the teeth and gums in a perfectly healthy state they began to gain in general

strength, which was followed by the birth of children. I agree fully in the manner of brushing the teeth advocated by Dr. Grady—that is, brushing them according to the way the teeth grow, but I do not allow brushing the gums. My first treatment is to give the patient's tongue and teeth a good cleaning somewhat after the order of Dr. Smith's method, and then give instruction how to brush the teeth, always from the gum margin down and up, never touching the gum with the brush, but use the finger for massaging the gums and cheeks, and when a mouth-wash or a dentifrice is necessary, prescribe accordingly.

With regard to the question of vitiated saliva, I did not know when I was instructing my patients to massage the gums and the inside of their cheeks that I was bringing about a healthy action of the salivary glands. That is one of the secrets of success in my method. I am very glad that Dr. Kirk spoke of it. Now I see better than ever the advisability of massaging the cheeks as well as the gums. The importance of keeping the tongue perfectly clean must be impressed upon every patient, especially those suffering from pyorrhea alveolaris.

Dr. L. ASHLEY FAUGHT, Philadelphia. As to the method of brushing the teeth I agree with Dr. Grady that they should be brushed from the gums to the ends of the teeth, and never in the reverse direction. These are always my instructions to my patients. I believe it would be a good idea to present the matter of cleaning the teeth and general hygiene of the mouth in the schools, but I am not clear as to the advisability of the essayist's method, by distributing leaflets or pamphlets to the children and to the teachers. My reason for that is that we had in Philadelphia a gentleman who had ideas on this subject and he prepared a paper which had the fortune to be published in one of the evening papers circulating among a very intelligent class of people. I took sufficient interest to see how many people ever read the article by referring to it in my conversations with my patients and people in general, and I was astonished to find

that not one had ever read it. If an intelligent class of people who read the newspapers will not read articles of this character in the public prints, what can we expect from leaflets distributed among the schools and teachers? I do not believe that they would be read. I think we have to get at them personally, we have to appear before the teachers, the children, and their parents gathered together at some selected point in the cities—some practitioner to appear before them and give a lecture and demonstration in cleaning the teeth. Get the parents to bring their tooth-brushes and have the children to bring theirs also, and give them lessons in cleaning their teeth. I have found that careful, intelligent people will clean the teeth in the front of the mouth, but if you go back in their mouths toward the distal portion of the arch you will find neglect beginning to creep in after you pass the second molars, and on the lingual surfaces of the lower teeth. The way we will have to get at the people and teach them these things is by personal contact, impressing on them the importance of these hygienic measures and of keeping the teeth clean. I think this is a better way than through the leaflets, as they will not read these things in print.

Dr. J. A. LIBBEY, Pittsburg. I want to commend Dr. Grady in his work along this line. I had a good deal of correspondence with him on this subject when I was president of the National Association, as there was not a subject that I was more interested in than this, and I hoped that we would accomplish more than had been accomplished at any other meeting.

I have made it a habit for many years during the visitors' days at the public schools to visit those of our city. Only a few years ago I was on one of these visits, and I started in with the primary department; I saw one of the teachers putting the children through an exercise, and I was much astonished. She was putting them through an exercise of brushing and cleaning the teeth. I believe that if

every school would begin with the primary department and give the exercise that she gave there, a wonderful amount of good would be done. I knew it was not appropriate for me to say anything there, because we were just there for a little while, and they were showing the little ones off. I asked the teacher if she would let me talk to the children just one moment. She consented, and I told the children what an advantage that exercise would be to them. I told them that the teacher had made a great mistake and I wanted to correct her. The children were all attention, and I criticized the way the teacher was showing them to brush their teeth. She was teaching them to brush their teeth crosswise, and I told them they could not clean their teeth that way. I then showed them the proper way, and the teacher consented to change the exercise. Just from that little incident it was surprising the number of parents that came to me and spoke of it. I think it had a good effect, and I consider it one of the best instructions I ever gave.

I think Dr. Grady is right in regard to the use of the brush, but I find a great many people do not know how to use it and what kind to use. Some use them too hard, some too soft, etc. I would rather use a soft piece of linen for the teeth as well as for the gums. If you will use linen you will get a better effect on the gums and teeth and keep the gums in a good healthy condition.

Dr. E. A. BRYANT, Washington. Dr.

Grady has been a school-teacher, and it is natural for him to be looking after the condition of the young. It goes to show what environment will do. What he said in the paper we cannot but commend.

Dr. GRADY (closing the discussion). I do not want to detain those who are left, but there are a few points in the discussion that I would like to speak of. Dr. Faught in speaking of these leaflets said he did not think they would be read. I think they would. They are not a textbook, but only for the general information of the teachers and parents to show them the value and necessity of keeping the teeth clean. Very few of them grasp what this means. My idea is to get the members of the school boards interested in these subjects, and you can then get at the children. I have found that in those states where there are dentists on these boards, who take an interest in this subject, the best results are obtained. In Richmond, where Dr. Stiff is on the board, they have accomplished considerable good along this line. With regard to brushing the teeth, I would say that the next most important thing to that is to keep the gums clean. After the teeth and gums are cleaned, the toothpick should be used to remove every particle from under the edges of the gums. Care should be taken to remove every particle of food lodged there.

On motion the meeting adjourned to meet again in Washington in 1904, at a date to be decided upon later.

NORTHEASTERN DENTAL ASSOCIATION.

Ninth Annual Convention.

WEDNESDAY—*Morning Session.*

THE ninth annual meeting of the Northeastern Dental Association was held on October 21, 22, and 23, 1903, in the Horticultural Hall, corner Massachusetts and Huntington avenues, Boston, Mass.

The convention was called to order Wednesday, October 21, at 11.30 A. M., with the president, Dr. John F. Dowsley, in the chair.

After some routine business had been transacted, the meeting adjourned until 2 o'clock.

WEDNESDAY—*Afternoon Session.*

The meeting was called to order at 2 P.M. by the president, Dr. Dowsley.

The vice-president, Dr. Henry McManus, was called to the chair, and

The President then read his address, an abstract of which here follows:

PRESIDENT'S ADDRESS.

It is not my purpose to make a lengthy address. Neither shall my words of welcome be spread out to such an extent that in expressing the welcome your patience is taxed. Boston is fast becoming noted from one end of the country to the other for the warmth of greeting extended to those who assemble here to deliberate in convention on questions and subject-matter of a scope sufficiently broad to interest every section of the country. The Northeastern Dental Association is in session, with a mission before it of dealing with broad questions which, though primarily of interest to New England, have a far-reaching influence and effect.

One of the chief topics I will deal with is the necessity of perfecting a reciprocal understanding or agreement among the New England states on the point of framing dental laws and regulations. At present there is throughout the country an incongruity in the legal standard of qualifications, constituting an injury to the educated beginner and the experienced practitioner. To eradicate and eliminate such a drawback is a task all should aim to accomplish.

It is not often that we can apply a political principle to the advancement of the best interests of our profession. The statesmen who make the general laws of the nation and guide the people in the affairs of state and business prosperity enunciate, at times, doctrines which admit of practice by any body of men who seek to attain a common object for the benefit of all. I refer to the doctrine of reciprocity. I will endeavor to point out, briefly, that this doctrine can be utilized by the dental practitioners of New England—and, for that matter, of the entire country. By applying

the basic principles of that doctrine it will be possible to attain what we all so earnestly seek—a national standard of efficiency.

The central thought of those who aim to place dentistry upon a sound basis of eminent efficiency is to make it possible for every practitioner, no matter in what state he may be located, to enjoy public confidence for his fitness, ability, and general qualifications. How can this great central object be accomplished? How can we map out the essential details giving the concrete results?

I should say at the outset that in New England we are a trifle better off than any other distinct section of the country, and that already some progress has been made in outlining a plan to bring our states to a uniform standard which will make reciprocity probable.

Let us agree upon a general standard of qualifications. Starting out with a given standard for each state, let us work as a unit to have these qualifications adopted into law in every New England state. The examining boards can work out the detail and put into operation the general system. This will give a uniform system of efficiency. The dental laws of Massachusetts would then be exactly like those of Maine or Connecticut. The applicant examined in Rhode Island would take, practically, the same examination as the applicant in Maine, Connecticut, Vermont, or Massachusetts. All, upon entering the profession, would start on the same footing. Of course the standard of qualifications must be high, and the present weaker systems must be brought up to the level of the strong ones.

The doctrine of reciprocal relations, benefits, and progressive unity enters at this point. If a practitioner desires to remove from one state to another he can do so without being obliged to take a new examination. His certificate would be as good in all states as in the one that originally granted it. Each state helps the other, and each body of practitioners helps all others. We all would rest on an equal footing, because by a

reciprocal agreement each state would put into force a similar standard of qualifications.

It would not be difficult to bring such a uniformity of laws into working operation. It behooves, therefore, the various state societies of New England to encourage the state boards in this matter. It would be in line of progressive improvement of the laws, and legislatures would gladly accord us assistance. I have not time to discuss the matter in detail. I simply give the general scope of the central idea. If we can bring about a uniformity of laws in New England, it will be the stepping-stone for a uniform system throughout the entire country. New England can take the lead, and this association will reap the credit of making a start.

Announcement has been officially made that the Fourth International Dental Congress will be held in St. Louis, Mo., August 29 to September 3, 1904, and the dental profession of the United States of America is asked to sustain its well-deserved pre-eminence professionally and its reputation for hospitality on that occasion. The event is worthy of our most serious consideration and our heartiest co-operation. World's congresses in relation to professional development are factors of our evolution from a disconnected series of small associated groups of dental organizations toward a homogeneous and international body politic.

The first national dental society in the world, the American Society of Dental Surgeons, which was organized in New York in 1839, was the material expression of a need for professional association profoundly felt by the best exponents of dental practice at that time, and the motive for their association was clearly expressed in one of the articles of their incorporation, viz, "to promote union and harmony among all respectable and well-informed dental surgeons; to advance the science by free communication and interchange of sentiments, either written or verbal, between members of the society, both in this and other countries; in fine, to give character

and respectability to the profession by establishing a line of distinction between the truly meritorious and skilful, and such as riot in the ill-gotten fruit of unblushing impudence and empiricism." While modern usage might be inclined to change the form of expression, sixty-four years of professional history and experience could not, I think, improve the spirit of the declaration or more accurately set forth the true purposes of professional association in dentistry. These purposes have been the vitalizing forces of dental society effort the world over, and are tending to the unity and harmony of dental ideals everywhere.

Through the interchange of ideas in the local society differences are gradually eliminated, so that in the course of time certain modes of procedure come to be the accepted methods of practice, and in the same manner the social aspect of a group of associated dentists come to be harmonized by the elevating effect of personal contact in society work. What is true of the local society is equally true of the National Association. The step to a world's congress of dentists becomes then a logical result of the continual operation of these same principles which brought the first dental society into existence, because based on a universal professional need.

We speak with just pride of "American dentistry." It is a phrase to conjure by, one which has been the "open sesame" to golden rewards for those who have upheld its standards in foreign lands. It has drawn the eyes of the world to America as the fountainhead of dental knowledge and attracted representatives of all nations to our educational institutions for the training which should win for them an equal advantage with their American competitors.

We have become accustomed to the feeling that we have but little to learn of dentistry from foreign nations. Let us be mindful of the fact, however, that Europe has been profiting by the examples which the successful practice of American dentistry has afforded. She knows our methods, she has studied the factors of our success, and more than

all else she knows our weakness. She has applauded our triumphs of ingenuity in all that pertains to dental art, and has remained silent—or at times has audibly even contemptuously smiled—at our lack of understanding of the scientific principles which underlie our professional work. She has quickly adopted all of our best devices and procedures and has surpassed us in scientific research after the causes of the phenomena with which we have to deal; she is acquiring scientific knowledge more rapidly than we are inclined to do, and it behooves us to look to our interests, lest at no distant day our professional crown of bays be transferred to more worthy brows.

We are called, then, to meet with our worthy colleagues of all nations in a great international congress having the same objects as those which characterized the first dental society ever organized. We have developed as a profession beyond geographical limitations and are today part of a professional world-power. We are asked to take our share in this international commerce of ideas with which we are especially concerned; to bring our best and to exchange them for the world's best in dentistry; to bear our share of the effort which the Fourth International Dental Congress will make toward harmonizing professional differences and unifying professional ideals. That, it seems to me, is the opportunity which this great international meeting offers to us, and the obligation is upon us, both as a society and as individuals, to give it the support and encouragement which the occasion demands.

I would therefore recommend with respect to this movement, first, that a proper resolution expressive of the approval and enthusiastic support of this association for the Congress be prepared and forwarded to the Committee of Organization; and second, that there be appropriated from the unexpended funds of this association a substantial amount of money as our contribution to the general expense fund of the Congress, and that the money when so appropriated be forwarded to the treasurer thereof.

And, above all, I desire to make a personal plea that the Northeastern Dental Association be represented in goodly numbers.

Discussion.

Dr. G. A. MAXFIELD, Holyoke, Mass. A great deal of criticism has been made in regard to the injustice done in the case of a man going from one state to another, in his having to pass an extra examination, and those who have criticized the laws say they should be changed at once in this respect. Those who make the criticism little realize how hard it is to change the laws. Efforts have been made for the last twenty-five years to get a universal divorce law, and it seems no nearer accomplishment now than twenty-five years ago. There have also been efforts to get a universal bankrupt law, but it has not yet been accomplished. A law of this kind is just as difficult to get with regard to dentistry as with other professions. We all recognize the desirability of reducing the requirements from a practitioner of dentistry removing from one state to another, and I think it could be done in the manner suggested by the president.

Dr. JAMES McMANUS, Hartford, Conn. I approve of nearly all the suggestions our president has made. I like his suggestions with regard to the state laws. He has made one suggestion, however, which I think is very valuable, but unfortunately I am afraid the association is not in condition to follow unless our membership is very much increased at this meeting; that is, to contribute a sum of money toward the St. Louis gathering that is to be held next year. I doubt if we have much money in the treasury, and this suggestion therefore needs careful consideration. I hope that we will give a sum of money, but I also hope that the membership of the society will be materially increased. He has spoken of the good of these international meetings and the good of association in the past, commencing with the original meeting in 1839, and expressed the hope that the coming meeting will register a large attendance. This is a matter

that interests me very much, as I remarked this morning that I was a member of the committee of the National Dental Association to work up interest in the National Association and endeavor to get members from the state and local societies to join the National Association. I am very anxious that this association shall be well represented at the St. Louis gathering, and also anxious that the representation from the different states shall be large.

I made a statement this morning regarding the membership from New England in the National Association. There are many more present now, and I will make the statement again. I wish also to have it understood that when I made the statement I did with regard to the membership in the National Association I was guided in my statement by the list of members given in Polk's Dental Directory for 1901. I told you how many dentists there were in each of the New England states, and the number that were members of the National Association. I have been criticized for the statements made. I want to have it understood that I am basing my statements on the report of the Dental Directory and also from the Transactions of the National Association from last year. The directory shows the number of dentists from Maine is 316, New Hampshire 175, Vermont 150, Massachusetts 1325, Rhode Island 161, Connecticut 428—giving for the New England states the number of dentists as 2555. Since 1901 there have been added to the number a good many, and I think there are at least 3000; and from four out of six of the states there is not a representative in the National Association. From the state of Massachusetts, with 1325 practicing dentists, there are sixteen that are members of the National Association, and from Connecticut, with 428 practitioners, there are twelve. I consider this a very small representation from New England, and I think it is the duty of the members present here that belong to these different states to make an effort to have their states better represented at the next meeting of the

National Association, and if possible get accredited delegates who will not only join the association this coming meeting, but will become permanent members.

There is another thing that I was criticized for saying, and that was with reference to the representation of some of the colleges in the National Association. I simply took my notes from the last printed Transactions of the Association. What was done at the last meeting I do not know yet, but I doubt if the increase has been very much. There are connected with the Harvard Dental School forty-three who hold the dental degree, and only four are members of the National Association. From Tufts Dental School there are twenty who hold the dental degree, and not a single member of that faculty was reported as a member of the National Association. I may be incorrect, but I do not think I am. For two such institutions in a city the size of Boston that are instructing so many of the future dentists—that six or seven only have interest enough in the National Association to become members, I think is a shame. I think there should be a large number from Massachusetts, and from Boston particularly. I like to give Boston all the credit that is due her, and I would like to feel proud of New England, but from the record I cannot. I do not think that New England has done what she should have done for the dental profession. I think also that it is the duty of the colleges and the teachers in the colleges to impress on the young men that go out from these schools the necessity of joining the association. I may be wrong, but I think that the state associations and the National Association have done more for the progress of dentistry than the colleges. I do not care to say anything against the colleges, as they have done a great deal for the profession, but I think the societies have done more. I feel that the state associations should be promoted, and that we should do all in our power to increase membership in them.

Dr. E. C. KIRK, Philadelphia. I

thank you for giving me an opportunity to say something on the very important suggestions in the president's address. With regard to the International Congress, I thought some months ago that I would have nothing else to say on this subject before societies until the International Dental Congress of 1904 was a matter of historical record. I have but one thought in regard to that great meeting, and that is to make it a success.

The development and evolution of the association idea has been very clearly brought out and expressed to you in the president's address. There is one phase, however, that he did not touch upon, about which I wish to speak. We know how the first association came from the gathering together of two, three, or half a dozen men in dentistry for the commerce of ideas, and to get from each other the good things they had to exchange. We know how that same principle expressed in the first dental meeting has stimulated the same movement not only throughout the United States of America, but even beyond the confines of New England and clear across the water, so that the dental association is one of the recognized forces for the education of the profession.

The first expression of this universal idea of association in dentistry had its start in France in 1889. This was continued in the congress of 1893 at Chicago, and then again in 1900 at Paris. Each convention showed an increase in attendance.

Now, this is your congress—it is the congress of every man who holds claim to reputable qualified practice, and membership is open to every man regularly qualified to reputable practice in each country. I do not want to throw any cold water on Dr. McManus' contention, but membership in a society is not a necessary qualification for membership in the congress. The fact that one is not a member of a state or local dental society will not disqualify him for membership in the Fourth International Dental Congress.

The machinery for this great work is

in motion. Blanks for securing memberships are in the hands of committeemen in every state in the United States. We have acceptances of invitations from nearly every country in Europe. In each one of the nations there is a central committee of publicity and propaganda to take charge of the securing of memberships, and memberships are coming from all the countries. We have at this time what we have never had before—and some here will be interested and very glad to know it—that is, we have the enthusiastic co-operation of our transatlantic neighbor on that little island of Great Britain from which our forefathers migrated. There have been many instances of friction between the dental professions of America and Great Britain—the two nations representing the highest civilization the world has produced. But happily all this friction has been wiped out; they are enthusiastically supporting this movement, and will be here by the largest delegation that has ever represented the profession of Great Britain in this country. The same thing so far as representation in the congress is concerned applies to Italy, Japan, Australia, France, Germany, and many other countries of Europe.

The local Committee of Arrangements has taken up the question of a place for the meeting. The meeting will be held in what is known as the St. Louis Coliseum building. It is not a part of the group of Exposition buildings, but it is in the central part of the city, and is the best place we have ever had for a congress. The building is large enough so that everything will be under one roof. There is a large room for the general meetings and rooms for the holding of ten section meetings simultaneously. There is also a large auditorium, capable of seating ten thousand persons, in which the banquet of nations will be held, and we hope to see that particular room filled with the representatives of the world's dentists in harmonious relationship. There are also arrangements being made for a restaurant, café, post-office, telegraph, and telephone facilities in the building.

There is another thing which the president spoke of in his address, and that is with regard to the difference in the state laws. We are in the beginning naturally provincial in our tendencies—are narrow—we can't help it—but this very thing which is of so great importance, and to which you respond sympathetically, of having a uniform legislation, is one of the questions that is being taken up by the great international congress movement as a distinct result of the international associative idea which the congress represents. The same with the educational matters. This great international congress movement will be a means to the wiping out of these sectional differences. This is the way your reciprocity will come, by letting them see what we have here, and what we are doing, and by harmonious social relationship with the other nations of the world and studying their methods; and that is the main feature and object of the congress. I hope this association will put all the money it can into the movement, and that the individual members will devote all the time they can spare to this work, and that they will send in their applications for membership as early as possible. There has been appointed a committee in each state to take charge of these memberships, and I hope to see good results from the committees in this section.

Dr. L. D. SHEPARD, Boston, Mass. As Dr. Kirk was speaking I thought I could add a little to his history by going a little farther back, and saying that the impulse for international congresses went back of the dates he gave you. In 1887, in Philadelphia, was held a meeting known as the International Medical Congress, which had a section on dentistry. There were dentists from all over the world that held memberships in that congress, and there was present at that time a gentleman who has taken a great interest in dental education in this country, whom you all know, and who died last Friday—Dr. Jonathan Taft. Previous to that, in 1881, at a

meeting of the International Medical Congress in London there was a large attendance from all over the world, and about sixty or seventy-five American dentists attended that meeting, among whom were Dr. McKellops, Dr. Taft, and many others who have gone before us. In my opinion that was the real starting-point of international dental congresses. It was certainly the place and the time when Great Britain was awakened from its plethoric indifference to modern progress, and took a start which has resulted in much good.

I have one word with regard to the adoption of the resolution for the appropriation of money for the movement. If there is money in the treasury and the congress needs it, all right, but I have found by experience that when an association votes money to a cause of this character the individual members of the association quote that as a reason why they cannot give anything individually. I have met with this experience, and unless there are sufficient funds in the treasury to make the amount of the appropriation of such size as would be valuable and appreciated by the committee of the congress, I should think it on that ground inadvisable to vote a sum of money—only on that ground.

Dr. A. J. FLANAGAN, Springfield, Mass. It seems to me that there is much talk and little action in this matter. I therefore move that a committee of three be appointed by the chair to report at the meeting to-morrow morning on the president's suggestions.

The motion was carried.

The Vice-president then appointed Drs. James McManus, Luther D. Shepard, and George A. Maxfield as such committee.

Dr. FLANAGAN. I move that a committee of five be appointed to devise ways and means for the furtherance of the financial interests of the Fourth International Dental Congress.

The motion was carried.

(To be continued.)

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EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, FEBRUARY 1904.

EDITORIAL DEPARTMENT.

SOME SUGGESTIONS WITH REFERENCE TO LOCAL ANESTHESIA.

SINCE the introduction of cocain salts as agents for producing local insensibility to pain, not only have numerous other substances been discovered having similar local anesthetic powers, but great advance has taken place in the technique and mode of use of these agents. There has been also a coincident enlarging of our knowledge of the nature of the process by which pain is obliterated through the application of these agents and a corresponding safety in their use has developed.

One of the most important advance steps in the use of cocain solutions for the induction of local anesthesia has been the recognition of the facts—First, that under certain circumstances the drug is highly toxic, and hence that it is necessary to confine the amount administered strictly within known physiological limits. Second, that the employment of sterile solutions is a necessity in order to avoid one of the causes of the necrotic inflammation which in many cases followed its earlier use. Third, that differences in the concentration of solutions affect the relative safety of their use.

The limitation of the dosage within the physiological limits of safety has tended to eliminate dependence upon percentage solutions, and to base the administration upon calculated or otherwise known amounts of the drug apart from the strength of solution.

The percentage strength of the solution is, however, a factor not to be ignored, especially where cocain solutions are injected into inflamed tissues, as in cases of pericementitis in the acute stage. It is in these cases especially that sloughing is apt to follow the injection, and it may

be due to the direct action of the cocain and quite apart from infection by a non-sterile needle or solution.

In an acute pericementitis the cellular elements of the tissues involved are already reacting violently to the toxic waste products of the bacteria which are the excitors of the morbid process. The toxic impress may be so intense as to depress the vital resistance of the tissues to a point bordering upon paralysis. In such a condition of the tissues the injection of cocain in concentrated solution is an added toxic agent of sufficient power to devitalize certain of the already weakened cells, and necrosis and sloughing follow as a logical consequence.

The well-known toxicity of cocain and its salts has limited their use to somewhat narrow fields and led to the study of means to secure the advantages of local anesthesia over a wider area of surgical procedures than could be ordinarily obtained by the maximum safe dose of cocain. Substitutes with claims of lessened toxicity have failed to supplant cocain as an anesthetic; its efficiency and reliability, notwithstanding its limitations, have given it a secure position—up to the present, at least.

The modification of technique introduced by Schleich and known as the infiltration method has, it is claimed, extended the range of usefulness of cocain and proportionately reduced its dangers. Interest attaches to the Schleich method not only because of the foregoing facts, but because of the extremely attenuated solutions of the drug which his method involves. A series of injections of the highly diluted cocain salt is made around the area of operation, each injection being made in such a manner and with such a quantity of solution as is sufficient to produce a blanched wheal or swelling from which the blood has been completely forced out by the solution. The tissue of the whitened area is found to be quite anesthetic. It is a well-known fact that the presence of blood in a tissue is necessary to normal sensation, and that stasis and congestion resulting in increased blood in a tissue are productive of exaltation of sensation. The converse is equally true, hence the forcing of blood out of a part, mechanically or by drug action, tends to lessen if not wholly destroy sensation. Indeed, the anesthetic effect of cocain upon certain surfaces—*e.g.* the conjunctiva—has been explained by some observers on the basis of the power of cocain to drive the blood out of the capillaries and away from the terminal nerve-filaments, thus producing a local ischemia.

While the vaso-motor effect of cocain salts must be admitted as a factor of their anesthetic power, it seems evident that the anesthesia which they produce cannot be wholly explained thereby, and it is reasonable to presume that the drug has in addition thereto a direct action upon the sensory nerve-endings. This dual quality of the rationale of cocain anesthesia becomes of interest and importance in connection with the future development of its use in anesthetic practice. The analgesic effect of mechanically forcing the blood away from the sensory nerve-

endings is shown in the Schleich method, where an exceedingly minute amount of cocain is required to complete the anesthesia when the tissue is distended and the blood driven out of it with water.

Cases of tooth-extraction performed painlessly by injection of distilled water, just as the Schleich injections are performed, have been reported by Dr. F. A. Lane (*DENTAL COSMOS*, vol. xxxiii, 1891, page 1040), and experience has shown that the "blanching" of the gum by the local anesthetic is one of the clinical details of a successful induction of anesthesia for tooth-extraction. These facts would seem to have a practical bearing upon the use of suprarenal extract as an adjuvant to cocain salts, especially in connection with operations upon the dental pulp.

The hemostatic property of suprarenal extract being its most evident quality, has directed attention more particularly to its value as a means for arresting capillary hemorrhage—a property which it possesses by virtue of its vaso-motor constricting power. Advantage may be taken of this property of suprarenal extract as a means of preventing hemorrhage, as well as for arresting hemorrhage after operation; thus the removal of a pulp by cocain anesthesia may be rendered quite bloodless by the addition of a small quantity of suprarenal extract to the local anesthetic application. But the action of suprarenal extract as an ingredient of the local anesthetic mixture is probably something more than that of a simple hemostatic. Its constrictor action upon the capillary vessel walls depletes the part by driving the blood back into the larger vessels, as shown by the blanching of the tissue after the extract has been injected. We have already referred to the necessity for blood in a part as a factor of its normal sensibility. Hence there is good ground for the belief that suprarenal extract acts in no small degree as an analgesic by exsanguinating the tissue, just as the injection of distilled water is known to do. Indeed, we have already received reports of cases of painless extraction of the dental pulp by applications of suprarenal extract alone.

If the suggestion that the exsanguinating power of suprarenal extract is a factor in the production of diminished sensibility of tissue be borne out by experience, the importance of this new drug in dental practice is of a high order. It will become a synergist of cocain which will make possible the use of much smaller and therefore safer doses for the induction of local anesthesia and render the desired result attainable on practically the same principles as the Schleich method without the disadvantage of having to inject bulky quantities of the solution. A bulky amount of fluid is in most dental applications a practical disadvantage, and in certain cases—as, for example, pulp-treatments—prohibitory. If the combination of cocain and suprarenal extract may be used with satisfactory results in quantities of a few drops, the range of usefulness of the preparation in dentistry will be greatly enlarged, both as to its application and its safety.

There is in our judgment a fertile field awaiting investigation in connection with the topic here outlined. The use of cocain salts as local anesthetic agents in dentistry, while productive of good results in a great many cases, has nevertheless led in some instances to disastrous and even fatal ones. It would surely be worth while to carefully and scientifically study the range of modification which suprarenal extract is capable of making in the amount of cocain salt necessary to induce satisfactory anesthesia in the several dental operations where the benign influence of cocain is demanded for the relief of pain. We trust that some of our readers will take up the question for systematic investigation, and publish their conclusions for the general benefit of the profession and humanity.

DENTISTS IN THE CHICAGO HOLOCAUST.

WE have never before been called upon to chronicle the death of members of our profession under more heartrending circumstances than in the cases of Drs. Alfred J. Oakey and Mervin B. Rimes, and the promising senior student Harold S. Bliss; yet, after all, their fate is but an incident in a tragedy unequaled in the history of our time. A little group seeking recreation and amusement, radiant with life and happiness and mutual sympathy, is wiped out in a few brief minutes amidst the inconceivable horrors of fire and panic.

It is too soon to moralize or draw conclusions. We know that somebody blundered, and that the effects of that wrong can never be righted. The awful fact remains—stares us in the face in dumb but eloquent appeal to human sympathy.

BIBLIOGRAPHICAL.

A DICTIONARY OF MEDICAL SCIENCE.
BY ROBLEY DUNGLISON, M.D., LL.D.
Twenty-third Edition, thoroughly revised by THOMAS L. STEDMAN, A.M., M.D., Fellow of the New York Academy of Medicine. Philadelphia and New York: Lea Brothers & Co., 1903.

Dunglison's dictionary needs no introduction to the medical or dental profession, and the fact that it is now in its twenty-third edition shows conclusively to what extent its value and usefulness have been appreciated by physicians and spe-

cialists in the several branches of the healing art. Since the publication of the first edition, nearly three-quarters of a century ago, the work has occupied a leading place in the realm of medical literature, and the changes and additions made to the successive editions have gradually increased its scope of usefulness until at the present time the twenty-third edition partakes more of the character of a medical encyclopedia than of that of a dictionary in the general acceptance of the term.

The issuance of each new edition has

required the insertion of new terms, the number varying in direct ratio to the advance of medical science; and the present edition contains over fifteen hundred additional words and definitions, especially in the fields of bacteriology and radiography.

The terms pertaining to dentistry were revised in the previous edition by the late Dr. H. H. Burchard, whose well-known ability, both as a practitioner and a writer on dental topics, fitted him admirably for the task, and in the present edition the reviser has introduced only such changes as are made imperative by the progress of dental science in recent years.

The excellent quality of the presswork is in accord with the adopted standard of the publishers, and the entire make-up is worthy of commendation.

J. E.

A COMPEND OF DENTAL PATHOLOGY AND DENTAL MEDICINE. By GEO. W. WARREN, A.M., D.D.S., Professor of Principles and Practice of Operative Dentistry in the Pennsylvania College of Dental Surgery. Fourth Edition. Philadelphia: P. Blakiston's Son & Co., 1903.

The value of compends in the study of medicine or dentistry depends just as much on the character and quality of their contents as it does upon the ability of the student to appreciate the aim and purpose of these publications. In the hands of ambitious and energetic students they serve to outline the plan of work, and to refresh their minds on the most salient points of those intricate problems frequently met with in the course of scientific study; but they serve a detrimental purpose in the case of those who rely on them as the only source

from which to derive their medical and dental knowledge. The information in compends partakes of the character of conclusions and may lead in the unmindful student to the injurious tendency of depending on others for the reasoning out and solving of problems which under different circumstances he would not hesitate, perhaps, to do for himself.

Dr. Warren's little book contains matter pertaining not only to dental pathology and medicine, but to dental physiology and anatomy as well. After discussing the development of the teeth, the author takes up the macroscopical anatomy of these organs, and follows this up by a study of some general features pertaining to the field of general pathology. On page 31, hypertrophy is defined as "an excessive growth of normal tissue by the multiplication of cells." We have to disagree with the author on his interpretation of this pathologic manifestation, inasmuch as hypertrophy does not imply a growth of tissue by multiplication of cells, but by an increase in their size; Dr. Warren has given to hypertrophy the definition pertaining to hyperplasia. On page 47 the statement is found that "exostosis, or hypercementosis, is a disease common to all bones, but owing to the vascularity of the cementum of the tooth it is oftener found there, to a greater or less degree, than in any other part of the osseous structure." This may lead in the inexperienced reader to an erroneous understanding of these two processes, as the author has classified them under the same heading. Of course hypercementosis refers specifically to an enlargement of the cementum, while exostosis indicates that of bone, and the statement that "exostosis or hypercementosis is a disease common to all bones" is unsustainable. In the defini-

tion for "dental materia medica" the author has included that of therapeutics and pharmaco-dynamics, as he states that it "is an embodiment of the nature, medicinal properties, and therapeutical action of all substances used as medicine in dental practice." In our conception, "materia medica," whether it be general or special, refers strictly to the physical and chemical properties of drugs, and to nothing else.

On page 93 appears an error frequently found in medical and dental works. We refer to "cocain hydrochlorate," which should be cocain hydrochlorid. On page 119, antipyretics are defined as agents "which reduce the temperature of fever." Undoubtedly what the author means is the temperature of the body. In discussing the physiological action of antipyretics no mention is made of their depressing action upon the heart.

We trust that these errors, as well as others in the Latin terminology, will be eliminated in future editions, thereby increasing the usefulness of the work.

J. E.

PRÉCIS D'ANATOMIE DENTAIRE. By J. CHOQUET, Chirurgien-Dentiste D.E. D.P. of the Faculty of Medicine of Paris; Professor at the École Dentaire. Paris: F. R. De Rudeval, 1904.

Dr. Choquet states in his preface that in writing this book it has not been his purpose to produce a work containing everything relating to the subject, but merely to include such data as may enable the medical and dental student and practitioner to gather a correct idea of the anatomy and structural characteristics of the teeth.

We are inclined to think that the author's statement is indeed distinctly modest, considering that in the seventeen

chapters into which the work is divided there is found most detailed and accurate information concerning the development with the anatomical description of the maxillary bones and teeth; a study in the variations of the form of the mandible in individuals of different races; the anatomy of the face; the form and size of the pulp-chamber at different ages; the morphology of the deciduous and permanent teeth; a study of the microscopical and macroscopical characteristics of the enamel, dentin, cementum, pulp, and pericementum; a description of the calcification of teeth; and finally, two interesting chapters on the relationship which the teeth bear to each other and on the physiology of the mouth and its contained organs.

The reviewer had the privilege of examining the work during its final preparation for the press, and expressed at that time the opinion that the work was second to none, not only because of the accuracy of the information contained therein, but further because of the character and quality of the illustrations which play such an important factor in the make-up of anatomical treatises. These illustrations were made from the author's original preparations, with the exception of cuts of some rare cranial specimens from the Paris museums.

We doubt not that the work will be warmly received by the dental profession, and that it will render valuable service in conveying correct interpretations on the subject of which it treats.

J. E.

ANESTHESIA IN DENTAL SURGERY. By THOMAS D. LUKE. New York: Rebman Company, 1903.

The author has succeeded in including in this little volume a considerable amount of interesting data regarding the

nature and special features of those anesthetics and anesthetic combinations used in connection with dental operations. The work is divided into ten chapters dealing with the history of anesthesia and the properties and modes of administration of nitrous oxid alone or in combination with oxygen, of nitrous oxid and ether, of ethyl chlorid and ether, of ethyl bromid and ethyl chlorid.

In Chapter VI the author discusses the administration of anesthetics in special cases, devoting special attention to the anesthetization of children and of adults exhibiting evidences of pathologic disturbances.

Chapter VII, which is on local anesthesia, is one to which the author devotes but little attention, stating that "A number of dental surgeons have used and advocated the use of cocain for extractions, etc., but it can scarcely be said to shine in this department."

Chapter VIII is devoted to the management of prolonged extraction cases, Chapter IX to the place of chloroform in dental surgery, and Chapter X to accidents of anesthesia.

The book contains much information easily assimilable, and is indeed a valuable contribution to the subject of anesthesia in dental surgery.

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REVIEW OF CURRENT DENTAL LITERATURE.

[*Giornale di Corrispondenza pei Dentisti*, Milan, December 1903.]

TREATMENT OF APHTHOUS STOMATITIS BY THE SIMULTANEOUS USE OF HYDROGEN DIOXID AND SODIUM BORATE. BY DR. MERLETTE.

Dr. Merlette (*La Medicina Internazionale Illustrata*) has successfully treated cases of aphthous stomatitis by the application upon the mucous membrane of hydrogen dioxid, immediately followed by that of a five per cent. solution of sodium borate. The dioxid is applied by means of a brush and is followed by the sodium borate solution, applied similarly.

Dr. Merlette has employed the method he advocates in a considerable number of cases, and is convinced, in view of the satisfactory results obtained, that three applications in

every twenty-four hours will cure the most severe cases in the course of two or three days.

[*Revue Odontologique*, Paris, November 1903.]

ULCERO - MEMBRANOUS STOMATITIS. (EDITORIAL.)

Tordeus invariably prescribes potassium chlorate in doses of from fifteen to thirty grains, according to the patient's age. His formula is as follows:

R—Potassium chlorate, gr. xv to xxx;
Decoction of cinchona, ʒij;
Orange syrup, ʒijss.

Sig.—One dessertspoonful every two hours.

The local treatment consists in the use of a mouth-wash of boric acid, sodium benzoate, or of topical applications of zinc sulfate or potassium permanganate in 1:1000 solution.

[*Nordisk Tandläkare Tidskrift*, 1903.]

A PECULIAR CASE OF INTERSTITIAL EMPHYSEMA OF THE CHEEK. BY DR. CHRISTENSEN.

While opening a devitalized lower right second premolar, preparing it for a root-filling, the drill, without meeting with any resistance, passed directly out into the alveolus, and upon withdrawing the instrument a yellow, serous liquid filled the carious cavity present. After washing it out with warm water Dr. Christensen used his hot-air syringe in forcing the water from the field of operation.

He had scarcely finished doing so when the patient, a young woman, became very much agitated, saying she felt a peculiar stiffness in the cheek and had become completely deaf in the right ear.

With great uneasiness he noticed that the cheek began to swell at an alarming rate, attaining in a few seconds the size of the swelling witnessed in cases of acute alveolar abscess.

The patient felt intense upward pressure in the head, and became extremely dizzy. Pressing the cheek with his fingers gave rise to a distinct crepitus sound, from which he reasoned that the whole trouble was caused by air having been forced into the tissues. After about half an hour's work he succeeded in forcing the greater part of the air back through the tooth by the use of his two index fingers applied one outside and one inside the cheek.

A few air-bubbles having ascended as high as the temple could not be forced back, but they disappeared after four days by absorption. The swelling in the cheek had completely disappeared after five days. The stiffness of the cheek, the deafness, and the sensation of dizziness disappeared as soon as the air had been expelled.

J. E. HEYKE, D.D.S.

[*L'Odonto-Stomatologia*, Naples, November 1903.]

SERIOUS SYSTEMIC DISORDERS OF DENTAL ORIGIN. (EDITORIAL.)

In 1831 Thomas Bell called attention to the case of a patient who suffered for a long time from paroxysmal pains in the neck, shoulder, and arm, and from marked decrease of mobility of the hand. All these phenomena were caused by the presence within the alveolus of a fragment of the root of a molar fractured during extraction.

In 1888 Lang referred to a case of trigeminal neuralgia of fourteen years' standing

being completely cured by the extraction of an impacted molar.

Hermann published in 1889 the history of a serious case of neurasthenia of twenty years' standing cured by the removal of a molar from the maxillary sinus.

Reflex epilepsy caused by peripheral nervous irritation of dental origin has been reported upon several occasions. Nicolas reported in 1889 the case of a patient who for eighteen months suffered from neuralgia and epileptic attacks, brought about by pathologic conditions of a third molar. Another case of epilepsy of dental origin was reported by Bukonesky in 1890.

Tuck in 1892 communicated two cases of paralysis of dental origin treated successfully by the extraction of affected teeth. Salomon in 1897 described an interesting case in which traumatic irritation of a dental pulp caused spasmodic contractions of the upper extremities.

One of the most frequent systemic disorders resulting from dental disturbances is trigeminal neuralgia, which may be induced by caries, pulpitis, pericementitis, hypercementosis, necrosed roots, impacted teeth, etc. The editor calls attention to the fact that physicians are inclined to disregard the relationship between the systemic disorders referred to and dental diseases, either because dental maladies can be diagnosed by dentists only, or because the patient usually suffers pain in regions outside of the teeth, and thus it happens that neuralgia and other disorders of systemic character that had persisted for years disappear by the accidental treatment of dental disturbances.

The author recommends that patients suffering from any of the several varieties of trifacial neuralgia of obscure origin should be examined by a competent dentist to avoid the possibility of a failure to cure by general treatment, which can be of little avail if the true cause is not eradicated.

[*Dental Brief*, Philadelphia, January 1904.]

THE CONSERVATIVE TREATMENT OF THE DENTAL PULP. BY A. L. BOWER. BOYERTOWN, PA.

The essayist discusses the operation of pulp-capping—without, however, going into details as to the factors upon which depends the success of the operation.

Referring to the properties a pulp-capping material should possess, we find the statement that "It should have anesthetic and germicidal properties." The author fails to mention for what reasons he considers it advis-

able that a pulp-capping material should have anesthetic properties—properties which we consider would be decidedly objectionable in any agent to be used as a protector of the pulp. Almost all pulps requiring capping are hyperemic, if not in a state of decided inflammation, and the capping formula should contain no agent whatever which might tend to paralyze vaso-motor action. If the pulp be the seat of mild inflammatory phenomena a sedative is indicated—never an anesthetic; for the latter, if applied upon the pulp, will mask all painful symptoms, at the same time inhibiting—or, even worse yet, paralyzing—vaso-motor action, thereby preventing the subsidence of the inflammation.

The author advocates the use of thymol and zinc oxid, and gives a list of cases in which their use has been followed by satisfactory results. The reviewer here finds it once more necessary to point out the tendency to omit bibliographical references in dental writings. These omissions are objectionable, not only because credit is not given where it properly belongs, but also because it leads to erroneous recording of dental discoveries, inventions, and methods. As the author has not touched on the history of the introduction of thymol in dental therapeutics, it may be of interest to make a few historical references in this review:

Hartmann in 1892 reported in the *Deutsche Monatsschrift für Zahnheilkunde* on the use of thymol in powdered and crystalline form in cases of pulpitis, stating that "the pulp is restored and not destroyed, as is the case with arsenic."

In 1894 Röse (*DENTAL COSMOS*, vol. xxxvi, page 41) reports on the result of his investigations on thymol as an ingredient in formulæ for capping pulps. Röse employed a combination of Fletcher's cement with pulverized thymol, and all cases thus treated—with the exception of one—remained entirely free from pain. In a few cases, he states, it was not possible to mitigate the acute painful attacks of pulpitis, and arsenic paste had to be resorted to.

Since then, thymol as an ingredient in capping formulæ has been widely introduced into this country through the efforts of Dr. Kirk, who has been teaching this method to his classes at the University of Pennsylvania since 1896.

J. E.

[*Western Dental Journal*, December 1903.]

AMALGAMS. By J. D. PATTERSON, D.D.S.

After calling attention to the several apparent objections to the use of amalgams, the essayist states that many dental alloys will

render good service if properly treated. Many amalgams, the author says, are good tooth-preservers—leaving out, of course, the silver and tin combinations, which are totally unreliable. In this group of defective combinations the author includes those containing cadmium.

In the ternary and quaternary amalgams, failures are almost solely due to faulty manipulation. The chief fault in the manipulation of amalgam consists in mixing the alloy with an excess of mercury, which must be removed or expressed. A mix of amalgam should always be weighed, so that with each mass used there will always be exactly the same proportions, and these proportions should be such that the small portions of amalgam can be thoroughly welded to each other under pressure without any excess of mercury appearing. Another fault is the method of mixing, such as rubbing together in the palm of the hand, crushing in a glass or Wedgewood mortar. The objection to the latter method is that the mass should be impacted only in the cavity where it is to remain, and any previous crushing prejudices the final setting, which will not exhibit its best strength. Besides, to amalgamate in the hand or in the mortar, too much mercury must not be used, or the mass will be uneven.

The essayist then refers to the fact that when amalgam is mixed in the usual way and the quantity of mercury is guessed at, every mix behaves somewhat differently and its lasting qualities must also be a matter of speculation. When proportions are a matter of speculation, results are often failures, as has been proved by a series of experiments concluded some ten years ago by the late Thos. Fletcher of Warrington, England, and lately confirmed by the experiments of G. V. Black.

Dr. Patterson, referring to Dr. Black's investigations, states that in his researches he has not recognized the importance of giving to each mass a decided and positive proportion of mercury by weighing the material. Dr. Fletcher proved that the system of mixing with excess of mercury and squeezing it out later with chamois, or during the packing, is a great mistake, and that the results are never to be depended on. Dr. Fletcher also says, "The mercury used must be no more than is sufficient to make the surfaces of the grains cohesive, and the filling is built up, not plastered." Dr. Patterson has used for over twenty years Fletcher's method of weighing, mixing, and inserting in the cavity in small portions under hard pressure and by malleting, and his results have confirmed Fletcher's claims.

[*British Dental Journal*, London, December 15, 1902.]

A NEW PORCELAIN COLLAR CROWN.

By ARTHUR L. BOSTOCK.

This crown consists simply of a gold collar fitted to the root and carrying an ordinary diatoric tooth, the tooth being molded by additions of high-grade porcelain fused to it so that it will accurately fit this collar and overlap it slightly, and which is by the same means, if necessary, adapted to the occluding surfaces of the opposing tooth or teeth. The root to be crowned is treated in the same way as for an all-gold crown, but as a necessity it must be ground down almost to the level of the gum, especially of the buccal surface.

A gold collar is made and fitted in the usual way: the height of the collar is only a little above the root level on the buccal surface, but somewhat higher on its other surfaces. This gold collar is forced to its place on the root, and a good quality diatoric molar of suitable size and shade is selected (these diatoric teeth are sufficiently strong to bear the ordinary strain of mastication). The bite is then taken in the usual way, and when the material which has been used for this purpose hardens it is removed, and if it be done with a little care it will result in the collar coming away from the root with the impression. Models are now made of the occluding surfaces and mounted on a crown articulator. The tooth previously selected is now ground to fit well into the collar and to suit the articulation.

The next step is to shape this tooth exactly as desired in its finished state. The essayist does this by using pink modeling wax, which when softened is placed inside the collar, previously dusted with French chalk, and the tooth is pressed into it until it reaches its place. The tooth-surface above the collar is molded with wax to overlap the collar at its edges, and further built up with wax where necessary, to suit the bite. The whole is then thoroughly chilled by spraying it with ethyl chlorid. The tooth and wax are now enticed out of the collar. Any fault is now corrected, and, continuing to use the spray before named to keep the wax hard, a thin strip of platinum foil is taken, of ample width to extend slightly over the tooth-crown and below the wax, showing the impression of the collar. This is burnished around the tooth where the collar impression shows itself in the wax. The portion of foil above the crown surface is also burnished down, that portion which extends below being

bent outward but kept level with the impression of the root surface.

The tooth with its foil covering is now sunk, with its crown downward, in investing material, the foil edges bent outward being covered, as this retains the foil in its place. The wax is now boiled out, replaced with high-fusing porcelain, and the crown is fused in the furnace. On stripping off the platinum foil, a complete porcelain crown which accurately fits the gold collar is again forced to its place on the root, the crown is inserted to test correctness of bite, and is again removed. The rubber dam is then applied over the gold collar and fixed with the usual clamp, the collar of the root surface being thoroughly dried. If the root be decayed down to any extent, or whenever possible, one or more very short posts may be inserted so as to assist in the retention of the crown.

Thin cement is placed in the counter-sunk hole of the crown and well around the root edges in contact with the gold collar, also around any post in the root, and the crown inserted into the collar. Sufficient pressure is used to force the surplus cement outward between collar and crown. If this be carefully done, the cement will find its way to a greater or less extent between the root and collar; all surplus cement is now removed, the gold collar is burnished down to the porcelain crown where possible, a suitable varnish is applied, and then a blast of hot air to harden the varnish and cement as much as possible, when the rubber-dam and clamp can be removed.

[*l'Odontologie*, Paris, November 30, 1903.]

ORTHODONTIA IN ITS RELATION TO MAXILLARY ORTHOPEDICS: CORRECTION OF BUCCO-NASAL ATRESIA. By DR. D'ARGENT, ADJUNCT PROFESSOR AT THE ÉCOLE DENTAIRE OF PARIS.

The essayist calls attention to the fact that many failures in the treatment of dental irregularities are due to a misconception of the nature of their cause. In the treatment of dental irregularities a confusion is often made between the existing deformity of the maxillæ and the malposed teeth, and this of course must result in total failure, inasmuch as treatment undertaken under the conditions here mentioned would be directed to the correction of a manifestation, and not to the eradication of the initial cause.

Thus, the author states, in the treatment of a large majority of cases of prognathism, the first step in the procedure should consist in opening the bite. This statement, because of

its incompleteness, may lead to an erroneous understanding of the principles upon which is based the treatment of maxillary prognathism, invariably the result of a contracted palate. The opening of the bite through mechanical means is not *per se* a procedure which will eradicate or mitigate the cause that led to the deformity under consideration, but, on the contrary, may aggravate the intensity of the disorder. In the treatment of this variety of cases the initial step should consist in the removal of the anatomical obstruction, viz, the elongated lower incisors, thereby enabling the upper teeth to retrude in consequence of the widening of the arch. It is not only for the bite to be raised, but it is principally that the line of occlusion should be modified so that the malposed teeth should not prevent the appliances used from bringing about the desired result, viz, the expansion of the arch. In the same way, in many cases of anteversion, retroversion, latero-version, and rotation the treatment should be undertaken with a view to first widening the arch before the malposed teeth are touched. Attempt at treatment of these irregularities by directly acting upon the teeth is not only a difficult procedure, but a useless one as well.

In the present communication Dr. D'Argent has taken up in particular the treatment of maxillary atresia, which may vary in intensity from the slightest deviation from the normal to an exaggerated narrowness of the buccal and nasal cavities. We are often confronted with children, and at times with adults, presenting exceedingly characteristic symptoms. The child is pale, thin, sad, restless, becomes easily fatigued, and is apathetic. The cheeks look hollow, the face is angular, the nose and nasal orifices small; the upper lip is pushed forward by the protruding incisors, which unite in the median line, forming an acute angle. The dental arches are very narrow, and the height of the palate is decidedly abnormal. This defective disposition of the palatal processes of the maxillæ and of the horizontal plates of the palate bones produces a corresponding protuberance on the floor of the nasal fossa and diminishes the functional capacity of the inferior meatus, and as the ascending portions of the maxillæ are brought closer together they push the middle and inferior turbinated bones toward the septum, thereby greatly reducing the size of the nasal cavity. These functional and physical symptoms appear early in life and become of a yet more severe nature if, as often occurs, adenoid growths develop.

Here, again, we beg to disagree with Dr.

D'Argent, inasmuch as the symptoms he has enumerated correspond exactly to the disturbances which follow the development and growth of pharyngeal adenoids. If, however, in the cases examined by Dr. D'Argent the functional and physical symptoms were due to a different cause, he has failed to mention it—implying as he does that the growths appearing subsequently to the functional disturbances would aggravate the existing conditions; whereas in our opinion these growths are the cause of the disorders he has described. The naso-pharyngeal region is directly concerned in the functions of both respiration and phonation, and the narrowing or obstruction of it interferes with the proper performance of these two functions, thereby inducing the general symptoms already mentioned. Under normal conditions nasal respiration is very beneficial, as it raises the temperature of the inspired air and saturates it with vapors of water; and further, the many folds and crevices of the nasal mucous membrane remove any organic or inorganic matter from the air to be inspired.

If the function of the nasal fossa be partially or totally interfered with it may become the seat of chronic rhinitis, followed soon after by adenoid neoplasms or hyperplasia. The author is of the opinion that atresia of the maxilla is the primordial cause of all the disorders which develop within the nasal cavity—not, as often thought, the effect of them—but of course they may become accentuated by the development of adenoid growths.

The appliances that have been devised from time to time for the correction of this deformity are all built upon the same principle. They are composed of a plate of vulcanized rubber to fit the abnormally formed palate, and divided longitudinally into halves. These two segments are united by means of springs, as in Coffin's plate, Talbot's, and Cecconi's; by means of parallel bars sliding into box arrangements, or by means of a double jack-screw, as in Kingsley's appliance. After having tried all of these methods the author limits himself exclusively at present to Kingsley's appliance, as it seems possible to obtain with it a greater degree of precision in graduating the pressure.

While, however, the principles upon which Kingsley's appliance is built are excellent, the plate presents certain disadvantages, such as lack of stability, especially when the arch begins to expand, increasing the space between the halves of the plate. For this reason Dr. D'Argent has devised some modifications,

which consist in the addition of two tubes, above, below, and parallel to the jack-screw. The tubes are sawed off at the same time as the plate is, and bars are inserted into them so as to allow free movement of the halves of the plate, at the same time securing stability of the plate and removing the possibility of its being displaced. Another important modification introduced by Dr. D'Argent consists in making a plate that does not adapt itself evenly against the palatal vault—avoiding all contact with its apex. By means of this modification lateral expansion is brought about more rapidly, as it does away with the resistance which in the original appliance is established by the continuous adaptation of the plate to the palatal walls.

Dr. D'Argent has also devised an appliance for the expansion of the mandible based upon the same principles as exhibited in his appliance for the expansion of the upper jaw. It is composed of a plate of vulcanite, inclosing the molars and bicuspid, and sawed off at the median line. The two parts of the plate are united by means of a jack-screw placed at about the level of the second molar, and of a sliding bar and tube arrangement at the level of the first bicuspid. (This appliance would be of course utterly useless, as it could never be inserted in the mouth, inasmuch as the jack-screw would interfere with the movement of the tongue, rendering speech and mastication altogether impossible!)

[*American Journal of the Medical Sciences*, Philadelphia, December 1903.]

A DEATH DURING GENERAL ANESTHESIA WITH ETHYL CHLORID. BY DR. FRANCIS OLCOTT ALLEN.

Dr. Allen reports a case of a colored man, aged twenty-eight, who was admitted to the Pennsylvania Hospital suffering from an incarcerated hernia. The patient was an epileptic, and had had his last convulsion three days before admission. The hernia could not be reduced, and he was prepared for operation. Anesthesia was started with ethyl chlorid, and progressed satisfactorily until narcosis was approaching, when the change to ether was to be made. About fifteen grams of ethyl chlorid were used. Just as ether was started the patient gagged and vomited an enormous quantity of an almost clear watery liquid, which for a time spouted from his mouth in a continuous stream, without retching or respiratory effort. The vomiting could not be controlled, and

with slight intermissions lasted for about two or three minutes. When it finally stopped, respiration was not resumed. Cyanosis was present and no pulse could be felt. Artificial respiration with traction on the tongue was continued for some minutes without effect. There seemed to be no air entering or leaving the lungs. No obstruction could be felt in the throat or trachea; there had been no solid matter in the vomitus. Permission for an autopsy was refused by the patient's friends.

The author relates that during the last six months ethyl chlorid has been used at the Pennsylvania Hospital quite indiscriminately for inducing general anesthesia for minor operations, or as an antecedent to ether for more prolonged narcosis. The results have been generally satisfactory. In some cases there has been struggling; in one child, an epileptic, convulsion occurred during the induction of anesthesia. In no case, except the one above reported, have there been alarming cardiac or respiratory symptoms. The method has been to spray the ethyl chlorid upon gauze held over the patient's nose and mouth, and the number of cases thus anesthetized has been about one hundred.

The author states explicitly that this case is not reported to condemn ethyl chlorid or to emphasize its dangers, which can hardly be held responsible for the fatal case under consideration, as the result might have been the same with any other anesthetic. He also quotes the statistics of general anesthesia with ethyl chlorid as given by Ware, who collected 12,436 cases with one *bona fide* death, and by McCardie, who mentions 16,000 cases collected by Seitz, with one death.

[*Oesterreichische Zeitschrift für Stomatologie*, Vienna, November 1903.]

THE HEMOSTATIC PROPERTY OF GELATIN. BY DR. LEOPOLD MOLL, ASSISTANT AT THE PHARMACOLOGICAL INSTITUTE OF THE GERMAN UNIVERSITY OF PRAGUE.

After a series of interesting observations, the author has reached the conclusion that the local application of gelatin upon a bleeding wound, or its intravenous injection, arrests hemorrhage by producing agglutination of the solid constituents of the blood and by stimulating and increasing fibrinogen production. The gelatin treatment, as a prophylactic measure, may be instituted several days prior to the operation, especially in cases in which the hemophilic diathesis is suspected.

PERISCOPE.

To Relieve Neuralgic or Muscular Pain.

—Guaiacol mixed with an equal part of glycerin and applied over the seat of neuralgia or muscular pain will often give quick relief.

—*Med. Summary.*

To Stop Nosebleed.

—Grasp the nose between the thumb and forefinger and press backward against the alveolar border of the maxilla, and downward against the teeth. This compresses the lateralis nasi and septal arteries. Satisfactory results also follow the use of tannin and acetanilid.—*Laryngoscope.*

Removal of Rust from Steel Instruments.

—To remove rust from steel instruments, Sangu recommends placing them overnight in a saturated solution of zinc chlorid. The rust disappears through reduction. On removing the instruments they are to be rinsed in clear water, placed in hot soda and soap solution, and dried. It is also advantageous to polish with absolute alcohol and chalk.—*Pacific Med. Journal.*

Absence of Recurrent Caries Around Porcelain Fillings.

—The opinion that caries rarely, if ever, recurs around porcelain fillings is general, and is again verified by careful notes taken, by the writer, of fused and ground porcelain fillings (not his own) placed in the mouths of residents of this city twenty-five years ago—which were all free from decay, though the cement had to a certain extent vanished from the joints.—CLARENCE J. GRIEVES, *University Orist.*

Don't Barb the Posts of Crowns.—In an effort to add retention qualities to porcelain crowns do not barb the post, as it will in most cases interfere with the proper adjustment of the crown. This was told you a few years ago by Dr. W. H. Taggart, but it is important and will bear repeating. A better method is to file small notches resembling saw-teeth on the sides of the post. This will not interfere with the adjustment of the crown and will add materially to the retention of the post in the root. The canal can also be prepared with retaining grooves cut around its sides with a wheel bur, but care should be taken to avoid cutting through the sides of the root.—H. A. Cross, *Dental Review.*

To Clean Plaster Bowls.

—When plaster has been left in the bowl till it becomes hard, pour boiling water in the bowl and allow it to remain for about two minutes. The plaster then can be easily detached in most cases without the aid of a spatula.—ABRAHAM M. WAAS, *Dental Review.*

Foreign Bodies Swallowed.

—Whenever a foreign body has been swallowed and it cannot be recovered by emesis (especially when it is anything sharp, like an open safety-pin), it is unwise to give purgatives. Better far to give a little opium with constipating food: potatoes, cheese, boiled eggs, etc., in the hope that the missing article may become imbedded in a mass and passed off without injury to the mucous membrane.—*American Journ. of Surgery and Gynecology.*

A Tooth-powder.—*Journal des Praticiens* (November 11, 1903) advises the use of the following tooth-powder for those suffering from pyorrhea alveolaris:

R—Prepared chalk, 3 ounces;
Finely powdered pumice stone,
Salol, āā 75 grains;
Peppermint oil,
Carmine, āā suff. quant. M.

Sig.—To be used mornings with a stiff brush and followed by an antiseptic mouth-wash.

—*New York Med. Journal.*

Oversight of Students.—Teachers who do their duty must keep the closest surveillance of each student throughout the entire college course; and even then, at the end of this long observation, it is sometimes difficult to judge accurately of an individual's fitness to receive the degree. Let every professor from this time till the close of the present session devote himself to the important task of studying well the capabilities of the students under him, to the end that a fair and equitable judgment may be passed upon each man coming up for graduation next spring. To do less than this is unfair to the profession, to the public, to the college, and last but not least, to the candidate himself.—*Dental Review.*

A New Amalgam.—Robert Winter of Berlin (*Nordisk Tandlakare Tidskrift*) has prepared a new amalgam said to withstand five times the stress of ordinary amalgam. It contains wolframite, hence its strength. Its color is also said to be a distinct improvement. Its method of preparation is not by the ordinary fusing and mixing method, but by reduction from the oxids of the metals by burning aluminum.

J. E. HEYKE.

Therapeutic Value of Radiant Heat.—Radiant heat from a red-hot coal fire, notwithstanding asseverations to the contrary, is effective in subduing the almost unbearable irritation of chilblains. The irritation is at its worst during about two hours in the twenty-four, and can be controlled for that period by holding each foot for a minute or two just as near to the fire as can be tolerated. Steeping in very hot water approximates to this. The trouble recurs the next day, but can be abolished in the same way, and after three or four repetitions a cure is effected.—*Therapeutic Gazette*.

Treatment of Burns.—Capurbano uses a solution of tannin in glycerin for the local treatment of burns and scalds. The solution is used in the strength of fifty per cent., and the glycerin must be pure. The bullæ are punctured, and gauze soaked in the glycerotannate is applied. The solution is again applied several times daily without removing the gauze, until the new epidermis is formed, and the gauze falls off. In burns of the third degree, the destroyed tissues are removed, so far as the part will permit, and the application is made in the same way. In this mixture the glycerin, as well as the tannin, is important, as the tannin alone cannot heal a burn.—*New York Med. Journal*.

Disinfectant Action of Alcohol Vapors.—Satta says that alcohol vapors have a very distinct disinfectant action, which has the advantages of being very prompt, not injuring fabrics, and not producing any poisonous effect in the atmosphere in which this vapor is used. The odor is not markedly irritant, the cost of the apparatus used is low, and the alcohol, which can be used at fifty per cent., is not expensive. Fabrics with delicate tints are slightly altered, however, by this process. This method is useful in rooms of patients with infectious diseases and in the disinfection of railway cars. The materials must be exposed to alcohol vapors for five minutes and then ventilated until the odor of alcohol is removed.—*New York Med. Journal*.

Diphtheria Antitoxin in the Treatment of Aphthous Stomatitis.—Influenced by several suggestive experiences of Sangiovanni, Gaspardi, and Santi, Del Manaco (*Revue mens. des Mal. de l'Enfance*, August 1903) was induced to use diphtheria antitoxin in the treatment of an infant one year old affected with a grave aphthous stomatitis which had produced a marked cachexia. The injection was promptly followed by a sensible amelioration in the general state, while at the same time the sublingual swelling, which had been unaffected by lotions of potassium permanganate and silver nitrate, rapidly disappeared.—*Amer. Jour. of the Med. Sciences*.

About Separating Teeth.—In cases of lost contact, where the teeth have dropped together, slow wedging will be required to move them sufficiently. I do this by placing the separator and lifting the teeth apart as much as seems judicious at the time, and then prop them apart by filling the cavity solidly with gutta-percha, extending it firmly against the approximating tooth. When this has become firm remove the separator. This is repeated once in three or four days until sufficient space is obtained. This has the merit of moving the teeth as much as may be required without creating soreness.—G. V. BLACK, *Northwestern Dental Journal*.

Don't Cast Metallic Dentures on Plaster Impressions.—It is a well-known fact that plaster of Paris is not capable of withstanding the application of extreme heat without marked change in bulk. It ought readily to be understood, therefore, that to undertake to cast base-plates or dentures to a plaster model, which necessarily must be subjected to heat in the process, invites failure of the plates fitting when placed in the mouth. To be brief, then, I would say that, to cast a base-plate which will fit the mouth, it must be cast to a model which is not perceptibly changed from perfect duplication of the form of the jaw upon which the plate is to rest.—R. C. BROPHY, *Dental Register*.

Prevention of Snoring.—Konrad Kuster (*Deutsche med. Woch't*) found that with the exception of certain diseases, such as hypertrophies and adenoids, etc., which obstruct nasal breathing, snoring is only a habit which may easily be overcome. Snoring is due to the patency of the mouth during sleep; snoring stops as soon as the mouth is closed. The condition is aggravated when the patient lies on his back. The author constructed a bandage to hold up the lower jaw, and to prevent its dropping during sleep.

These bandages may be used on children who habitually sleep with their mouths open—a habit which produces catarrhal conditions, deafness, etc. The bandage should be applied every night until the child has become used to nasal breathing.—*Medical Age*.

Antiseptic Mouth-wash.—The following is an excellent formula according to *Merck's Report*:

R—Formalin,	ꝑv;
Tincture of benzoin,	ʒiij;
Tincture of myrrh,	ʒj;
Oil of peppermint,	ꝑiij;
Oil of anise,	ꝑij;
Oil of cassia,	ꝑj;
Oil of cinnamon,	ꝑxv;
Alcohol,	ʒij. M.

Sig.—Use as a mouth-wash once daily.

—*Monthly Cyclopaedia*.

Treatment of Alveolar Abscess with Fistula.—Take a broach wound with a wisp of cotton, dip in trichloroacetic acid, and pump the acid through the opening on the gum. Care should be taken not to allow any of the acid to come in contact with the mucous membrane of the mouth, as it will burn and cause considerable discomfort. We do not get any of this trouble when careful, and the small amount coming through the opening on the gum does not trouble the patient, although it causes a whitening of the tissues immediately surrounding the opening. After injecting the acid I seal the tooth and dismiss the patient for two or three days; then remove the stopping, thoroughly wash out the canal with hydrogen dioxid, and repeat the treatment. Almost all cases will yield to two treatments. I would fill the root and tooth after the second treatment and expect in a week at least to find the fistula thoroughly healed.—C. C. NOBLE, *Dental Register*.

Selection of Anesthetic for Children.—

Although chloroform is considered to be more dangerous than ether in adults, its use in children has been very generally recommended because of the belief that children were practically immune to the bad effects of chloroform. S. J. Kopetzky (*Medical Record*, October 3, 1903) believes that chloroform is dangerous because an overdose may be too easily given, and his contentions are borne out by many men who have had occasion to give it in a large number of cases. Cardiac failure may set in at the very beginning of the anesthesia, because of the violent and dangerous struggle which takes place in frightened children. Death occurs suddenly

and without warning. The tendency to push the anesthetic is too tempting, especially when the patient is afraid and struggling. Cardiac syncope following vomiting may occur at any time during or after the administration of chloroform, and may result fatally. He particularly warns against the practice of beginning operation before complete anesthesia, and also against the use of chloroform in the upright position.—*Medical News*.

[Cardiac syncope at the beginning of the administration is an accident often observed in the case of chloroform anesthesia because of the selective action of this agent upon the substance of the heart, inhibiting and eventually paralyzing cardiac action.—*Ed.*]

To Insure Stability of a Lower Plate.—

It must be conceded that in constructing a lower denture absolute perfection of adaptation of the base to the alveolar ridge is quite as important as would be the case were capillary attraction depended upon to hold it in place. When perfect adaptation of the base to the process has been accomplished, next comes the exercise of strategy to evoke mechanical aid in sustaining the plate in position. Much may be done toward aiding the unfortunate individual who wears an artificial lower denture in gaining the retentive ability to keep it in place. One of the most potent of these aids is to carry the postero-lingual wings of the denture well downward, and, by finishing with marked concavities the lingual surfaces of these wings, tend to aid retention of the plate through the tongue's lying in these grooves or concavities. Great care should be observed in relieving the denture of all impingement tending to lift it from a solid seat on the ridge, the mesio-lingual region demanding particular attention.—R. C. BROPHY, *Dental Register*.

Treatment of Chronic Hypertrophic Pharyngitis by Scarification.—

Escat (*Archives internat. de Laryngologie*, July and August 1903), while advocating the application of solutions of iodine and sprays, together with constitutional treatment, in dealing with ordinary cases, believes that where there is much interstitial thickening, free scarification gives the best results. His scarifier consists of eight blades with lancet-shaped points, which can be lengthened or shortened as required.

Before operation an antiseptic gargle is used for five minutes, after which a cocaine solution is applied, followed by scarification of the soft palate and uvula longitudinally

and transversely. Hemorrhage soon ceases, and the treatment is completed by an application of Ranault's solution of iodine or zinc chlorid 1:30. If dysphagia occurs, sedative gargles are used.—*Canadian Practitioner*.

Boiling Points of Metal.—By the use of vessels of quartz heated by an electric furnace Krafft has determined the boiling-point of certain metals, as follows: Zinc sublimes below 300°, and at 640° distills fairly quickly; the corresponding temperatures for cadmium are 322° and 448°. Selenium distills quickly at 380°; tellurium at 550°, boiling being observable at 535°. Lead boils rapidly and distills at 1160°. Tin proved very refractory, no distillation occurring even at 1100°. At 605° antimony sublimes slowly, and at 775° to 780° rapidly. Sublimation of bismuth commenced at 540°, the sublimate assumed the form of drops at 930°, and the metal boiled briskly at 1050°. A slight mirror of silver appeared at 1090°, and rapid vaporization proceeded at 1340°. Copper and gold boil at too high temperatures to be examined, even in silica; with the former a slight amount of sublimate formed at 1315°, and with the latter extremely little vapor arose even at 1375°, which is near the point at which the resistance of silica breaks down.—*Pacific Med. Journal*.

To Repair a Badly Broken Vulcanite Plate.—We are often called upon to repair a rubber plate that is so badly broken that it is a question whether a new plate would not be preferable, the question of expense to the patient, or time, being the only objection. The articulation being perfect, an entirely new denture can be made with very little trouble and almost as quickly as the old one can be repaired, by the following method: Cement the pieces together as accurately as possible and insert in the lower half of the flask, keeping the plaster even with the edge of the rim of the plate. Oil the surface of the plaster, rubber, and teeth, and build more plaster around the outside of the denture and up even with the occluding edges of the teeth; when this is sufficiently hardened, oil this surface, place the other half of the flask in position, fill with plaster, and allow to harden. The flask will separate very easily, leaving the plaster rim around the outside of the teeth, which we next remove and place in the upper part of the flask. By heating the old denture the rubber can be easily removed, leaving a perfect impression of the palatal portion of the mouth. Remove the teeth from the old denture and place in the impressions in the upper part of the flask,

proceeding then to pack the rubber as in any other case. When finished we have an entirely new denture with comparatively little work.—C. C. NOBLE, *Dental Register*.

The Future of Gold as a Filling Material.—If we may judge from the past, taking into view the origin of gold as a filling material, its use until the period when it reached its greatest perfection in practice, and then its decline as an absolute standard of excellence, we may confidently assume that the day will come when its use will be classed as belonging to the barbaric period in dentistry. This may seem an impossible conception, but we have not far to go for a basis upon which to build a prophecy of the future. It is very possible that the present craze for porcelain fillings may eventually reach a lower level than it occupies today, but the present indications point directly to the time when it will supplant gold in the large majority of cases coming under dental care, and when plastics, in some form, will subserve dental purposes for the remainder. This, to the gold-worshipper, is an inconceivable idea, but if he will only review his dental history he will find, as stated, that there has been a gradual but very sure departure from the old ideas, and dentistry in this country could not go back even were it desirable so to do—to the period antedating the "new departure" creed. Change is in the air, and the restless life, ever seeking something new, will drive us on until gold is no longer known as a filling material for the salvation of teeth.—*Internat. Dental Journal*.

A Test of the Time for the Digestive Act.—At the Society of Biology of Paris, October 31, 1903, Drs. Sicard and Infroit detailed the results of some tests made to show the propelling power of the human intestinal tube. They used an ordinary cylindrical gelatin capsule, 15 mm. long by 6 mm. wide (about nine-sixteenths by four-sixteenths of an inch). The capsule was first filled with bismuth and afterward immersed for a few seconds in collodion, so as to get a covering on its surface which would make it impervious to the digestive juices. By means of the X rays it was then possible to localize the different positions occupied by the capsule during its transit through the intestines. After being swallowed in the morning by a fasting individual, the capsule remained in the greater curvature of the stomach about half an hour. Eight hours afterward it had reached the cecum. The passage of the capsule through the seven or eight meters of the small intestine in eight hours was too

rapid to permit the experimenters to obtain suitable pictures. On the contrary, it remained about four or five hours at the cecum. It passed through the ascending colon in one or two hours, the transverse colon in two or three hours, the descending colon in three or four hours, and at from the twentieth to the twenty-fourth hour came to a stop in the sigmoid flexure of the colon, where it remained ready for expulsion.—*Canadian Journ. of Med. and Surg.*

Resinous Varnishes.—In sensitive cavities no material so nearly fills the requirements of an ideal lining as some of the various varnishes made from some of the resins. They furnish a non-conducting and impermeable film covering the dentinal walls, occupying small space, sealing the tubuli and combining mechanically with the tooth-structure, thus forming close adhesion between the plastic and cavity walls. The best varnish for such a purpose is a solution of the resin of *pinus silvestris*, two drams dissolved in one dram absolute alcohol, as recommended by Dr. A. C. Hewett of Chicago. This resin is a product of the Scotch fir, and is sold in music stores, being commonly known as "fiddle-bow rosin." This, like all gums of its kind, possesses antiseptic properties from the essential oils contained therein. It makes a hard glossy coating, and when applied to a dry, sensitive cavity and dried, acts as an instant insulator. Another adhesive and antiseptic cavity varnish is that of gum copal dissolved in ether, alcohol, or chloroform, to which may be added about ten per cent. hydronaphthol. Other varnishes of merit are sandarac, Canada balsam, mastic, dammar, etc., but the *pinus silvestris* solution is by far superior to all other resins. In cases where fillings of gold and alloy approximate in adjoining cavities, viz. in vital bicuspsids or molar teeth, a galvanic current is often produced; the electrolytic action may be greatly modified by varnishing the cavity before the fillings are inserted.—B. L. THORPE, *Western Dental Journal*.

Comparative Germicidal Efficiency of Disinfectants.—It is time that some system of control should be organized with regard to disinfectant preparations by which some assurance could be given of their actual germicidal efficiency. There is no doubt that many proprietary disinfectant preparations on the market have exaggerated claims made for them in this respect, and there are not a few which are practically worthless as germ destroyers. From time to time private investigations have been made on correct lines, in

which the relative germicidal efficiency of a number of disinfectant preparations has been stated, and the results have been of value. But it seems to us that what is wanted is a well-organized system by means of which the absolute efficiency of a disinfectant preparation can be guaranteed. The need of such an organization is felt in America as well as in other countries, and recently a practical paper upon the subject was read by Mr. B. R. Rickards at a meeting of the Massachusetts Association of Boards of Health, Boston, the details of which are of interest. The author's results may be thus summarized: Formaldehyd solution or formalin, although commonly supposed to be superior to carbolic acid as a liquid disinfectant, is really much inferior in equivalent per centum solutions. This fact is all the more striking when the high efficiency of formaldehyd as a gaseous disinfectant is considered. Formaldehyd is also a most efficient deodorizer. The coal-tar proprietary compounds are, as a rule, very good disinfectants. They are not any better, however, than carbolic acid. Moreover, the composition of the proprietary articles may be varied and the purchaser be none the wiser. Carbolic acid is preferable in all cases when its odor and properties are not objectionable. The various colorless solutions put upon the market under fanciful names are, as a rule, of little value as disinfectants, their cost usually increasing in inverse ratio to their efficiency.—*Lancet*.

Systematic Performance of Dental Operations.—To me the most important thing in any given operation is to have a definite method of procedure which is always to be followed, and not to go at the work in a "haphazard" way, doing a little here and a little there, and always at a loss to know when you are through. In cleaning the teeth it is my custom to begin by taking off the salivary calculus from the lingual surfaces of the lower incisors, as there I am liable to find it in greatest abundance, and can get the largest particles to show the patient, so as to make him feel just as ashamed of himself as I possibly can for neglecting his teeth. Sometimes he will say that he forgot to brush them before he came to the office, or give some other excuse equally amusing. It is surprising what can be done with some patients at this operation in arousing a pride in the care of the teeth. Many who have never been in the habit of caring for the teeth at all, when they see what nice teeth they really have when they are uncovered to view, will begin to feel an interest

and a pride in them and in caring for them, and will be most enthusiastic in this regard. After the deposits are all removed from the lingual surfaces of the lower anterior teeth, having worked into the interproximal spaces also, I proceed to the bicusps and molars—their lingual and interproximal surfaces. Then I turn to the labial surfaces of the anterior teeth and work back to the molars. This done, I turn my attention to the upper jaw, and here I follow a different order—beginning at the buccal surface of the third molar. This is done so that any hemorrhage which is likely to be induced will not obstruct my view as I proceed forward. The buccal and labial surfaces are first cleaned and then the lingual. The frequent use of warm water, or even hot water, to wash out the mouth during this operation, is of course indicated; the water may be injected into the mouth with a syringe and the debris and blood-clots very effectually removed. Just what order one follows is not the important thing, but that one does have a definite, systematic way of doing the operation, and follows that way carefully.—RALPH W. PARKER, *Northwestern Dental Journal*.

Trigeminal Neuralgia Treated by Intra-neural Injections of Osmic Acid.—Murphy (*Journ. of the Amer. Med. Association*) reports the case of a man seventy-six years of age who had suffered from neuralgic pains in the right side of the face for thirteen years. Examination revealed slight tenderness over the supra-orbital and infra-orbital divisions of the fifth nerve at their foramina of exit; no areas of hyperesthesia or anesthesia, and no evidences of tumor or inflammatory processes along the course of either nerve. Murphy used the intraneural injection of osmic acid solution as recommended by Bennett. In his paper Bennett reports ten cases treated by this method, with most gratifying results in all.

The following is the technique of the operation, as given by Bennett and carried out by Murphy: The nerve is exposed through a small incision about a half-inch in length. The nerve is elevated by means of a blunt hook, and from five to ten minims of a fresh 1.5 per cent. solution of osmic acid injected directly into its substance. An ordinary hypodermic syringe and fine needle are used, and the solution injected in several different places, to be sure that every fiber is reached. After this is accomplished a small amount of the solution is injected between the nerve and its sheath in the bony canal. During the procedure a small pledget of cotton is

held around the needle to absorb the excess of solution which regurgitates, and to protect the skin. The local action of the osmic acid on the terminal nerve filaments exposed in the wound is probably beneficial, so a small amount of it should be allowed to come in contact with them. After the injection is completed the incision is closed with horse-hair or catgut suture; primary union follows, and healing is not interfered with by the action of the acid on the tissues. Local anesthesia should be used for this operation in the majority of cases. All three nerves—supra-orbital, infra-orbital, and mental—were injected. The operation lasted only about twenty-five minutes.

The patient's pain entirely disappeared, and there has been no recurrence during the five weeks since operation. The acid probably acts in one of two ways, or possibly in both: first, by producing a degeneration of the nerve on the proximal side of the injection, toward the ganglion; or, secondly, by causing a local destruction of the nerve and its terminal filaments. The former seems the more likely explanation of the two.—*Therapeutic Gazette*.

"Dentored Dentures."—In reference to Dr. Haskell's article, "Science Run Mad," in December *Brief*, will say that my experience with "dentored dentures" has been very pleasing. Before I read Dr. How's paper in October *Cosmos* I had a case where I made a full upper plate over three times and another dentist of our city tried twice; both of us failed in securing a satisfactory adaptation. There being both hard and soft places in the mouth, I tried the usual methods and gave the case especial study, and was unsuccessful every time. After reading Dr. How's article I made the plate according to his instructions, making an uninterrupted groove just below the buccal and labial muscle attachments and across the palatal arch very near the soft palate. I made another groove the shape of an ordinary air chamber in the vault of the mouth. When the denture was completed I put it in the patient's mouth, and saw at once that I had success. I left it in for ten minutes and then asked the patient to remove it for me, and to his great surprise he could not. I had to use a great deal of force to remove it, notwithstanding my knowing how to do it better than he. I requested him to return to my office in three days, which he did. I found several places where the dentors had produced some inflammation because of being too high; using sand-paper, I lessened the height and replaced the plate in the mouth. I saw the

man a week later. He was perfectly satisfied; there was not the least irritation, and my dentors had been successful in giving me a perfect adaptation. I saw my patient a few days ago—about two months since I put in the plate—and I think he was the happiest person I saw on the crowded streets of Denver. I was successful with the dentors in another case that was extremely difficult to fit, proceeding just as I did in the first case. I do not take issue with Dr. Haskell at all, but only wish to record my success in using the dentors. What is the difference what method we use so long as we get a perfectly fitting denture and please our patient? This has certainly been a great satisfaction to me. I trust that this report will be the means of the dentor helping some other perplexed brother.—RICHARD A. SPRAKE, D.D.S., *Dental Brief*.

Improved Tincture of Iodin.—According to Claret, an improved tincture of iodine may be made by dissolving 1 gram iodine crystals and 2 grams borax in twelve grams of 90 per cent. alcohol. According to the author, the addition of the borax prevents the formation of hydriodic acid which otherwise takes place in the solution and which is the cause of considerable irritation and pain when the tincture, as ordinarily made, is applied to the skin.—*Pacific Med. Journal*.

Dangers of Gelatin Injections.—Since gelatin injections were first recommended for the control of severe hemorrhages in various organs, and for the treatment of aortic aneurism they have been used quite extensively. Much has been said in favor of this method, but several deaths have resulted. The fatal results were due to such complications as septic thrombosis, phlegmons, malignant edema, and particularly to tetanus. Several communications have recently appeared which again strongly emphasize the dangers connected with the subcutaneous injection of gelatin. Chauffard reported a fatal case of tetanus following a gelatin injection, and states that seventeen similar cases have previously been placed on record. Dieulafoy a few weeks later reports another instance of fatal tetanus developing after a gelatin injection given to control a severe tubercular hemoptysis, and he adds four more cases not included in Chauffard's statistics, bringing the total number of such deaths to twenty-three. Quite an elaborate study on the dangers and the therapeutic value of gelatin injection has been published by Doerfler, who has twice lost patients from tetanus following

subcutaneous application of gelatin. In one instance the method was resorted to to control a severe postpartum hemorrhage, in the other case to stop a tubercular hemoptysis.

It is now well known that tetanus following gelatin injections is almost universally due to the introduction of tetanus spores with the gelatin in which they were contained. Levy and Bruns obtained bacilli from eight out of thirteen samples of gelatin examined. It was formerly believed that the spores of the tetanus bacillus are killed by an exposure during eight minutes to streaming steam at 100° C., but the authors quoted have shown that even after thirty minutes' exposure some tetanus spores survive, and only after thirty-three minutes were all samples of infected gelatin so exposed found absolutely free from tetanus germs. According to Forster and Brehmer larger masses of gelatin must be exposed forty minutes to a temperature of 100° to 120° C., and this after a preliminary warming, before all tetanus spores are killed. Many of those who have used gelatin injections have not been aware that it is necessary to so extend the period of sterilization. In quite a number of fatal cases of tetanus following gelatin injections it was subsequently demonstrated that the gelatin used contained tetanus bacilli or spores. In other cases the sterilized gelatin left was found free from living tetanus spores. We understand now that the sterilization was insufficient, and while it may have made one part of the gelatin free from tetanus spores, it left them alive in other portions.

Doerfler states that prolonged and energetic sterilization does not at all interfere with the therapeutic value of gelatin, and that if really sterile it is absolutely void of any danger. He concedes that the great hopes placed in gelatin injections in the treatment of aortic aneurism have not been realized, but that it has done excellent service in tubercular hemoptysis, or pulmonary hemorrhage from other causes, in intestinal, renal, vesical, and uterine hemorrhages, in hemophilia, and in melæna neonatorum.—*Journ. Amer. Med. Association*.

The X Rays in Lupus and Rodent Ulcer.—Malcolm Morris and Dore (*Brit. Med. Journ.*, June 6, 1903) give their latest experience on this subject. Their conclusions are that in the case of lupus the X rays are much inferior to the Finsen light treatment. The rays, however, supply certain shortcomings of the light treatment, as they can be applied to cavities inaccessible to the latter; they are also more effective on mucous membranes.

They are indicated in the healing of ulcerated surfaces. The combination of the two methods, reinforced, if necessary, by pyrogallic, salicylic, or carbolic acid, gives good results in lupus. As to the permanence of these results, it is too early to speak definitely, but at any rate the disease can be kept under control. As regards rodent ulcer, relapse is the rule, and in some cases all that can be done is to keep the disease in check.

Sequeira (*ibid.*) is more sanguine as to the results of X-ray treatment in rodent ulcer. He has had nearly one hundred cases since January 1901, and the good results have been maintained. The author makes some remarks on the changes produced in the growth, the question of recurrence, and the conditions which favor success. As regards the origin of rodent ulcer, Sequeira points out that it is still debatable whether the origin is in the hair follicle, sebaceous gland, or sweat-gland. In some of his sections it appeared to start in the hair follicle, and in several cases the point of origin was a mole. The point of origin is of interest, because the X rays have a marked effect on the hair bulbs. At present it is impossible to determine whether the damage done to the epithelial cells is the direct effect of the X rays, of leucocytic invasion, or of obscure nervous changes. While the destruction of epithelial cells is going on, there is an infiltration of round cells, resulting in scar tissue. The activity of the connective tissue causes filling up of cavities

caused by rodent ulcer. Recurrences are not uncommon and may be due to some outlying cells having escaped the action of the rays.

Sequeira does not advise the use of the rays where the growth can safely be removed by the knife. Cases where complete removal by the knife is impossible without causing great deformity are suitable for the rays. In two cases, where the orbit was excavated, temporary relief was obtained, but both subsequently died from meningitis. The author has had many cases free from recurrence for a year, but in nearly half there have been slight recurrences; these, however, can be dealt with afresh. In small ulcers, healing may take place after a dozen exposures, but in large cavities months may be required. The rays are applied on alternate days in slight cases, but daily in extensive ones. Tubes are used which spark at four to six inches. Actual burning is not necessary, and some of the best results were obtained without any inflammatory reaction. The surrounding skin is protected with lead masks. The author gives details of two cases which affected the right ala nasi, and had lasted twenty years before treatment. One had been operated on frequently, with resulting hideous deformity; the other had undergone no operation, and the result was excellent. Sequeira concludes that the X rays still hold the field as the best therapeutic agent in cases where excision of rodent ulcer cannot be done.—C. F. M., *Treatment*.

HINTS, QUERIES, AND COMMENTS.

TEMPERAMENTS AND THE COMPLEXION.

THE classification of temperaments by the complexion presents a strongly marked distinction. The following groups of basal temperaments have been arranged as a guide in artistic dentistry:

Group I.—Dark complexion: *Bilious* temperament; teeth of a yellowish bronze color, rather narrow at the neck, long in proportion to the width; articulation firm and close.

Group II.—Fair complexion: *Sanguine* temperament; teeth cream color, of average size, about the same at the neck as at the cutting edge; articulation moderately firm.

Group III.—Pallid complexion: *Lymphatic* temperament; teeth dark, rather clouded in appearance, large and broad with thick and rounded cusps; articulation loose and flat.

Group IV.—Light complexion: *Nervous* temperament; teeth pearl-blue or gray, decidedly narrower at the neck than at the cutting edge, with long bite and prominent cusps; articulation close and penetrating.

I recently prepared an article classifying the sub- or mixed temperaments in four groups, making the color of the hair the distinctive element. [See DENTAL COSMOS for November 1903, p. 915.] Sometimes bilious and nervous temperaments are confusing in classification in regard to the color of the hair; the complexions, however, have strongly marked distinctions—as the first and fourth groups indicate.—GUSTAVUS NORTH, D.D.S., *Cedar Rapids, Iowa.*

TREATMENT OF TOOTHACHE BY INCANTATION B. C. 4000 (?)

A RECENT review of the work "The Devils and Evil Spirits of Babylonia," by R. Campbell Thompson, M.A., now being published in London, gives—among other incantations translated from cuneiform inscriptions in the British Museum and dating as far back as 4000 B.C.—one for the cure of toothache. The reviewer says, "A good example of this

type of incantation is the exorcism of the worm, to be used in case of toothache, 'believed to be due to the gnawing of small worms.' This commences with the creation of the world—the heavens by Anu, the earth by the heavens, the rivers by the earth, the canals by the rivers, the marshes by the canals, and the worm by the marshes. The worm then weeps before Shamash and Ea, asking what shall be its food. It is given, among other things, dry bones for food. Then it says:

'Let me drink among the teeth,
And set me on the gums;
That I may devour the blood of the teeth,
And of their gums destroy the strength.'

The exorcist, having thus shown his knowledge of the cause of the toothache, is instructed to utter his exorcism thus: 'O Worm, may Ea smite thee with the might of his fist!'"—HENRY N. DODGE, A.M., M.D., D.D.S., Litt.D., Morristown, N. J.

OBITUARY.

DR. THOMAS BROMWELL WELCH.

DIED, at his residence, Overbrook, Philadelphia, December 29, 1903, of apoplexy, THOMAS BROMWELL WELCH, M.D.

Dr. Welch was born in Glastonbury, Eng., in 1825. His education was mostly obtained in the public schools of Watertown, N. Y. He later took a course in the Gouverneur Wesleyan Seminary, and began to preach when nineteen years of age. After preaching a few years, and having decided to take up the study of medicine, he matriculated in the New York Central Medical College, from which institution he was graduated in 1852.

Appreciating the possibilities in the field of dentistry, in 1855 he entered upon the study of this specialty under the guidance of Dr. Foster of Watertown, N. Y., and the following year moved to Minnesota, where he remained until 1868, during which year he came East, starting in practice in Vineland, N. J. Dr. Welch did not devote himself ex-

clusively to the practice of his chosen profession, as he originated and placed before the dental profession several varieties of filling materials. In 1881 he began the publication of the *Items of Interest*, and remained its editor until July 1896, when the Consolidated Dental Manufacturing Company purchased the journal and removed it to New York.

Dr. Welch, besides his manifest interest and zeal in matters relating to dentistry, took a deep interest in the study of phonetic spelling, and many of his literary products in later years were printed according to his conception of English orthography.

Dr. Welch took an active part in the deliberations of the New Jersey State Dental Society, and was at one time its executive officer.

In Overbrook, where he had been residing for several years prior to his decease, he was well known, venerated, and loved as the village "Santa Claus"—a title that came to

him by reason of his affection for children, among whom he often made liberal distributions of gifts of a character to delight and please his little friends.

Dr. Welch was married in 1847 to Miss Lucy Hutt, who died April 1894. He is survived by his second wife, who was Miss Victoria Sherburn of Vineland, N. J., and to whom he was married in October 1895, and by his children—Dr. George B. Welch, Washington, D. C.; Dr. Charles B. Welch, Westfield, N. J.; Dr. Emma Welch Slade, Vineland, N. J.; Dr. Clara Welch Gould, Moore, Pa.; Mrs. Villa Welch Murray, Washington, D. C.; and Mrs. May Welch Thomas, Cynwyd, Pa., who, together with his many friends, are now mourning the irreparable loss they have suffered.

DR. LEWIS TILLOTSON LAWTON.

DIED, at his home, 489 Grand avenue, St. Paul, Minn., August 26, 1903, LEWIS TILLOTSON LAWTON, in his sixty-fourth year.

Dr. Lawton was born in Wilmington, Vt., December 13, 1839. At the age of nineteen he entered upon the study of dentistry as a pupil of Dr. J. M. Commegys of Brattleboro in the same state. Upon the conclusion of his apprenticeship he opened an office in Rutland, Vt., where he remained in practice for twenty years. In 1885 he removed to St. Paul, Minn., where his professional attainments became widely known and recognized.

The pathetic chapter in his life dates from a trip to Washington state in the summer of 1893, when he was the victim of a steamboat explosion on the Snake river. As a result of the accident Dr. Lawton was confined to a hospital for five months, and shortly after his return to St. Paul he was obliged to undergo a serious surgical operation—no one believing at that time that his determination to eventually resume the practice of his profession would ever be realized; however, in 1895 he had so far recovered as to resume practice.

Dr. Lawton was a man of sterling character and worth, and his fortitude of character suggested itself in every act of his private and professional life. He was a member of the Vermont State Dental Society, and filled the presidency of the society for two terms.

Dr. Lawton was married in 1865 to Miss Anna L. Hoxsie of Rutland, Vt., who with three sons, Lewis H., John R., and Harry C. Lawton, survives him.

DR. J. A. BALLENTINE.

DIED, at Jonesboro, N. C., August 21, 1903, at the age of forty-five, J. A. BALLENTINE, D.D.S.

Dr. Ballentine was born in Harnett county, N. C., February 23, 1858. He entered upon the study of dentistry in 1880 by matriculating in the Baltimore College of Dental Surgery, from which institution he was graduated in 1882. Immediately upon the conclusion of his studies he entered upon the active practice of his profession by opening an office in Fayetteville, N. C., from whence he later on moved to Jonesboro in the same state, where he remained in practice up to the time of his death.

Dr. Ballentine was a faithful and honest practitioner of more than ordinary skill, and an active member of the North Carolina Dental Society. In 1894 he was married to Miss Minnie Bell, who survives him.

DR. M. LUKENS LONG.

DIED, at Germantown, Pa., December 1, 1903, at the age of seventy-seven, M. LUKENS LONG, D.D.S.

Dr. Long was born December 1, 1826, in Warrington township, Bucks county, Pennsylvania, his ancestors being among the first settlers of that district. Early in life he devoted his attention to the practice of dentistry. A graduate of the Philadelphia Dental College of the earlier period, he was one of the long-time practitioners of this city, keeping at active work for more than forty years and relinquishing his practice only when failing health forced him to retire.

Always cheerful and happy in himself, his presence brightened those around him. Of marked ability in his art, his removal from the more active path of professional life was keenly realized at the time of his retirement. For the past four years Dr. Long had lived quietly with his family in Germantown. With his death passes one of the pioneers of his profession, whose earnest study and devotion to his work lent much to its advancement.

A conspicuous feature of Dr. Long's life

was his faithful attendance at the monthly meetings of the Academy of Stomatology of Philadelphia until forced to retire on account of ill health.

Dr. Long was a member of the Alumni of the Philadelphia Dental College and an honorary member of the Academy of Stomatology of Philadelphia. He is survived by a widow and one son.

DRS. ALFRED J. OAKEY AND MERVIN B. RIMES.

PERISHED, in the calamitous conflagration at the Iroquois Theater, Chicago, December 30, 1903, ALFRED JOHN OAKEY, D.D.S., and MERVIN B. RIMES, D.D.S.

Dr. Oakey was born October 29, 1863, and was married September 5, 1889. He was graduated from the Chicago College of Dental Surgery in 1889, beginning dental practice at once in Chicago, which he continued there until his untimely death.

Dr. Oakey was an active member of the Methodist Church, as well as active in Y. M. C. A. work. His exceptional vocal ability made his services much sought after at church and other entertainments. He was a member of the Englewood (Chicago) Dental Society and of the Royal League. He leaves a widow and two sons, aged respectively seven and five years.

Dr. Mervin B. Rimes was born March 19, 1867. He was graduated from the Chicago College of Dental Surgery in 1891, and has practiced in Chicago since that time. He married Miss Bertha Luff on September 28, 1891. A daughter, two and one-half years of age, survives him.

Dr. Rimes was a Mason, an Odd Fellow, and a member of the Englewood Dental Society. A friend writes of him: "He was always doing some kind act, and one was made happier by meeting him, for he always had a kind word for and about everyone."

Dr. Rimes, Mrs. Rimes and three young sons, and Dr. Oakey and his two little daughters, formed a theater party on the afternoon of December 30, 1903, at the ill-fated Iroquois Theater, it having been the custom for the two friends to take Wednesday afternoon for their half-holiday. All perished together, and the bodies were so sadly burned as to be identified with great difficulty.

Both Dr. Oakey and Dr. Rimes were genial,

companionable men who made friends rapidly, and will be greatly missed by a wide circle. They were men of high ideals, and their standards of excellence in all their professional work and relations were the best.

The following memorial resolutions were passed by their colleagues of the Englewood Dental Society:

"IN MEMORIAM"—DR. A. J. OAKEY.

Through the will of an all-wise Providence we are called upon to mourn the loss of one of our most beloved members, who, with his daughters, met death at the Iroquois Theater fire, December 30, 1903.

Dr. A. J. Oakey began the practice of dentistry in 1889, having been graduated that spring from the Chicago College of Dental Surgery. He served his patients faithfully and well; he made himself honored and respected by the dental profession, and was an active member in society work, having helped to organize the Englewood Dental Society, and having been one of its early presidents. He later served the same society as secretary for a term of two years, and since that time had been active and zealous in promoting its interests and in elevating the standard of his profession.

RESOLVED, That in the death of Dr. Oakey the members of the Englewood Dental Society have suffered an irreparable loss. Through association with him in the past they had learned to love him as a friend, to respect him for his high sense of honor, and to look upon him as a consistent Christian man.

RESOLVED, That an expression of our sympathy and condolence be extended to his bereaved family, especially to his wife, who is so bravely and beautifully facing the inevitable.

RESOLVED, That a copy of these resolutions be placed upon our records, and also that copies be sent to the leading dental journals for publication, and to the family.

T. ELHANAN POWELL,
W. B. WINGET,
H. O. BROWNING,

Committee.

"IN MEMORIAM"—DR. M. B. RIMES.

Through the providence of God, whose law controls the destiny of man, the career of Dr. M. B. Rimes, an active member of this society, has been brought to a sudden close. He, with his wife and three children, met death at the calamitous Iroquois Theater fire, December 30, 1903.

Dr. Rimes began the practice of his profession in Englewood, March 1891, after finishing

his course in the Chicago College of Dental Surgery. He had a large *clientèle*, whose confidence in his ability was amply justified by the results of his efforts. He was jealous for the honor of his profession and was active in promoting its interests. He efficiently served consecutively as secretary and president of the society, and was active in recruiting its membership among the younger men coming to our locality. His life was consistent with his principles and with his ideals, and he was respected and loved by his associates.

RESOLVED, That we give to the remaining members of his family an expression of our sympathy in their great bereavement.

RESOLVED, That a copy of these resolutions be made a part of the records of the society, and that copies be mailed to the leading dental journals for publication, and to his family.

T. ELHANAN POWELL,
W. B. WINGET,
H. O. BROWNING,

Committee.

DR. HARRY S. TERRY.

DIED, of typhoid fever, at Detroit, Mich., December 15, 1903, HARRY S. TERRY, D.D.S., in the twenty-sixth year of his age.

Dr. Terry was born in Detroit on June 17, 1877. He attended the public schools of that city, graduating from the Central High School with high honors. He then entered the dental department of the Detroit College of Medicine, continuing at this institution during his freshman and junior years. His senior year was spent in the Columbian University, Washington, D. C., from which institution he received his degree of D.D.S., with honors, in 1899.

Several months later he established himself in private practice at Detroit. He affiliated with the local dental society, and was a member of the Iota Chapter of the Delta Sigma Delta fraternity. He was also a member of the Detroit Wheelmen, and had but recently been elected to the office of its secretary. His re-election for the coming year was beyond doubt, his popularity in this organization being such that it was impossible to get any one willing to run against him—an honor rarely shown by this club to an officer.

The young men of Detroit and the young men of his profession have lost a bright and promising colleague.

"IN MEMORIAM" RESOLUTIONS.

Dr. Francis M. Odell.

At a regular meeting of the First District Dental Society of the State of New York, held November 10, 1903, the following resolutions were adopted:

Whereas, On October 11, 1903, Francis M. Odell, M.D., D.D.S., an honorary member of this society, and its secretary for some years in its early days, started on that "unknown journey,"

RESOLVED, That we the members of the First District Dental Society in regular session assembled, testify to the loss we feel in his departure from our midst;

To the loss the community has sustained since he has ceased to be able to give them the benefit of his well-trained mind and his skilful hand;

To his skill, which has preserved thousands of human teeth to remain a comfort to his former patients in their old age, which in itself is the highest praise we can bestow;

That we appreciate the work he has done for this society and for the scientific advancement of dentistry during his entire career;

That the fortitude and patience he displayed during the last ten years of his life, constantly battling with a dread disease which not only prevented his practicing his profession, but entailed untold suffering, makes his character stand out in a manner most creditable and worthy of emulation;

That we condole with his bereaved family, and that a copy of these resolutions be sent to his widow and to the dental journals, and also be inscribed on our official minutes.

S. L. GOLDSMITH,
W. E. HOAG,
M. L. RHEIN,

Committee.

Dr. Jonathan Taft.

THE Odontological Society of Chicago at a meeting held on January 12, 1904, adopted the following resolutions:

Whereas, It has pleased the Divine Ruler to call into eternal rest Jonathan Taft, who passed the portals of the great unknown October 15, 1903, after a long and vigorous career of usefulness in the profession; and

Whereas, This society especially feels his demise, from the fact that one-half of the members constituting this body have received a large portion of their early dental knowledge and training directly from his lips; and we further recognize that he was unique in his power to impress upon the

pupils who sat under his instruction sound principles of ethics and practice. He was great in his goodness, a characteristic which stands as a shining light for others to see and follow in his footsteps; therefore be it

RESOLVED, That the Odontological Society of Chicago hereby testifies to the loss experienced by the profession in the death of Dr. Taft, and extends sympathy to the family in their bereavement; also

RESOLVED, That these resolutions be spread upon the records of this society, and that a copy be forwarded to the dental journals for publication.

(Signed)

J. G. REID,
L. L. DAVIS,
J. W. WASSALL.

Mr. Harold S. Bliss.

The Racine Dental Society adopted the following resolutions upon the death of Harold S. Bliss, who met death at the Iroquois Theatre fire:

Whereas, We have been grieved to know of the removal from this life of one who as

boy and man we had learned to respect and love, whose promise of future usefulness in our chosen profession bespoke a flattering career as student and practitioner, we deem it fit and proper at this time to pay our tribute of respect to his memory and to voice our sorrow at his loss; therefore be it,

RESOLVED, That in the death of Harold S. Bliss our community has lost a man of sterling worth and our profession a student and worker whose progress in the profession was a source of pride to the faculty and his friends. We deplore his untimely death, and offer to his stricken mother and family our deepest sympathy in their sad bereavement. May the years to come soften the bitterness of their grief in the assurance that this noble soul has returned to his God. Further

RESOLVED, That this resolution be engrossed and forwarded to his mother, and a copy furnished to the dental journals and the local press for publication.

F. L. CLIFFORD, *Pres.*,
W. H. FANCHER, *Sec'y.*

SOCIETY NOTES AND ANNOUNCEMENTS.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization Dental Congress.

H. J. BURKHART, Chairman.

E. C. KIRK, Secretary.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee

thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen.
- IV. Hygiene, Prophylaxis, Therapeutics, Materia Medica, and Electro-therapeutics. Chairman, A. H. Peck.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown.
 VI. Orthodontia. Chairman, E. H. Angle.
 VII. Operative Dentistry. Chairman, C. N. Johnson.
 VIII. Prosthesis. Chairman, C. R. Turner.
 IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy.
 X. Legislation. Chairman, Wm. Carr.

COMMITTEES.

Following are the committees appointed:

- Finance. Chairman, C. S. Butler.
 Program. Chairman, A. H. Peck.
 Exhibits. Chairman, D. M. Gallie.
 Transportation. (To be appointed.)
 Reception. Chairman, B. Holly Smith.
 Registration. Chairman, B. L. Thorpe.
 Printing and Publication. Chairman, W. E. Boardman.
 Conference with State and Local Dental Societies. Chairman, J. A. Libbey.
 Dental Legislation. Chairman, Wm. Carr.
 Auditing. (Committee of Organization.)
 Invitation. Chairman, L. G. Noel.
 Membership. Chairman, J. D. Patterson.
 Educational Methods. Chairman, T. W. Brophy.
 Oral Surgery. Chairman, G. V. I. Brown.
 Prosthetic Dentistry. Chairman, C. R. Turner.
 Local Committee of Arrangements and Reception. Chairman, Wm. Conrad.
 Essays. Chairman, Wilbur F. Litch.
 History of Dentistry. Chairman, Wm. H. Trueman.
 Nomenclature. Chairman, A. H. Thompson.
 Promotion of Appointment of Dental Surgeons in the Armies and Navies of the world. Chairman, Wms. Donnelly.
 Care of the Teeth of the Poor. Chairman, Thomas Fillebrown.
 Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
 Prize Essays. Chairman, James Truman.
 Oral Hygiene, Prophylaxis, Materia Medica, Therapeutics, and Electrotherapeutics. Chairman, A. H. Peck.
 Operative Dentistry. Chairman, C. N. Johnson.

Resolutions. Chairman, J. Y. Crawford.
 Clinics. Chairman, C. E. Bentley.*
 Nominations. (To be appointed.)

Ad interim. Chairman, G. I. V. Brown.

The officers of the Congress, president, vice-presidents, secretary, and treasurer, will be elected by the Congress at large at the time of the meeting, and will be nominated by the Nominating Committee.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
 E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.
 DAVID R. FRANCIS, *President of Exposition*.

* Resigned.

Fourth International Dental Congress.**COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.**

J. A. LIBBEY, *Chairman*,
524 Penn Avenue, Pittsburg, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing membership as prescribed by the Committee on Membership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of dentistry*. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state chairman, whose indorsement is a certification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the Committee earnestly appeals to each eligible practitioner in the United States who is interested in the suc-

cess of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are—

General Chairman—J. A. LIBBEY, 524 Penn Ave., Pittsburg, Pa.

States.

Alabama. H. CLAY HASSELL, Tuscaloosa.
Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.

California. H. P. CARLTON, Crocker Bldg., San Francisco.

Colorado. H. A. FYNN, 500 California Bldg., Denver.

Connecticut. HENRY McMANUS, 92 Pratt St., Hartford.

Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.

District of Columbia. W. N. COGAN, The Sherman, Washington.

Florida. W. G. MASON, Tampa.

Georgia. H. H. JOHNSON, Macon.

Idaho. J. B. BURNS, Payette.

Illinois. J. E. HINKINS, 131 E. 53d St., Chicago.

Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.

Iowa. W. R. CLACK, Clear Lake.

Kansas. G. A. ESTERLY, Lawrence.

Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.

Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.

Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.

Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.

Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.

Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.

Missouri. J. W. HULL, Altman Bldg., Kansas City.

Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.

New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.

New York. B. C. NASH, 142 W. 78th St., New York City.

North Carolina. C. L. ALEXANDER, Charlotte.

Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.

Oklahoma. T. P. BRINGHURST, Shawnee.

Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.

Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.

South Carolina. J. T. CALVERT, Spartanburg.

Tennessee. J. P. GRAY, Berry Block, Nashville.

Texas. J. G. FIFE, Dallas.

Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.

Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.

West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.

Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.

For the Committee of Organization,

EDWARD C. KIRK, *Secretary*.

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH.

THE next meeting of the Southern Branch of the National Dental Association will be held in Washington, D. C., February 23d to 26th inclusive. The association will meet conjointly with the District of Columbia Dental Society and Maryland State Dental Association, in response to an invitation from those local organizations.

The opening meeting will be held in Columbian University Hall, Fifteenth st., cor. "H" st., N. W. The clinics and other meetings of the association will be held in the Medical and Dental Department building of the Columbian University on "H" st. between Thirteenth and Fourteenth sts.

There will be a banquet at the New Willard Hotel on Thursday evening, February 25th, given by the Maryland State Dental Association and the District of Columbia Dental Society, complimentary to the Southern Branch of the National Dental Association as their guests.

The Southeastern Passenger Association grants a rate of one and one-third fare, plus twenty-five cents, from all points in territory

south of the Ohio and Potomac, and east of the Mississippi.

The hotels of Washington have granted reduced rates as follows: The New Willard (headquarters), \$2.50 and up, European plan. The Raleigh, \$2 and up, American plan. The Ebbitt, \$3 and up, American plan. The Riggs, \$3 and up, American plan. The Oxford, \$2 and up, American plan. The Hamilton, \$2.50 and \$3.50, American plan.

Ample provision will be made at the University for clinics and exhibits.

All practitioners who conduct themselves according to the code of ethics are cordially invited to attend.

The following is a partial list of the papers and clinics that have been offered:

PARTIAL PROGRAM.

Papers.

"The Preservation of the Temporary Molars and Cuspids." N. N. Vann, Attala, Ala.

(Subject to be announced.) Dr. Milam, Little Rock, Ark.

"Cavity Lining—Importance and Value in Operative Dentistry." A. C. Hewett, Chicago, Ill.

"Punctured and Split Roots and Their Treatment." Dr. Jos. Head, Philadelphia, Pa.

"The Limitations of Dental Prophylaxis." M. L. Rhein, New York, N. Y.

"Filling Root-Canals." L. G. Noel, Nashville, Tenn.

"The Four-year Course: Is It Necessary?" H. F. R. Snyder, Baltimore, Md.

"Extensive Bridging After Pyorrhea Alveolaris." Fred. Primrose, Baltimore, Md.

"Porcelain." L. W. Farinholt, Baltimore, Md.

"The Tactful Management of Young Patients." T. Q. Heathwole, Baltimore, Md.

"Oral Sepsis in Childhood, with its Attendant Evils." Bessie B. Bennett, Baltimore, Md.

"Paper by the 'Annual Essayist.'" J. A. Chapple, Atlanta, Ga.

"The Two Sources of Tooth-life and Their Relative Importance." D. D. Smith, Philadelphia, Pa.

"The Educational Value of the Study of Dental History." (With one hundred lantern slides.) Chas. McManus, Hartford, Conn.

"Common Mistakes Made in Articulating Full Dentures." E. M. Kettig, Louisville, Ky.

"Something or Other about Chemistry." D. R. Stubblefield, Nashville, Tenn.

"Various Reforms in Prosthodontia." Stewart H. Spence, Chattanooga, Tenn.

"Vulcanite: Various Tests and Results." J. A. Hall, Collinsville, Ala.

(Subject to be announced.) Williams Donnelly, Washington, D. C.

"Education—Duty—Faith." J. H. Crossland, Montgomery, Ala.

Clinics.

"Changing the Shape and Position of Irregular Natural Teeth in Adults by Means of Silk Twist." Robt. E. Payne, New York, N. Y.

"Construction of Artificial Vela for Cleft Palate." R. Ottolengui, New York, N. Y.

"Adhesion of Cement to Porcelain and Dentin." W. V-B. Ames, Chicago, Ill.

"Central Incisor, Mesio-proximal Occlusal Surface; Dealing with Flat Surfaces and Angles." T. S. Waters, Baltimore, Md.

"Use of the New Front-tooth Matrix." Wm. Crenshaw, Atlanta, Ga.

"Filling Teeth with Soft and Cohesive Gold in Combination." C. L. Alexander, Charlotte, N. C.

"Porcelain Inlay." C. A. Romenger, Reidsville, N. C.

Clinic by E. J. Tucker, Roxboro, N. C.

"Gold Inlays for Contour Work." A. M. Jackson, Macon, Ga.

"Oral-surgical Clinic." G. V. I. Brown, Milwaukee, Wis.

Clinic by W. B. Finney, Baltimore, Md.

"Treatment of Approximal Spaces." C. M. Gingrich, Baltimore, Md.

"Construction of Saddle Bridge." C. J. Grieves, Baltimore, Md.

Clinic by A. C. Brewer, Baltimore, Md.

"Treatment of Sensitive Dentin with the Hurd Gas Apparatus." Joseph Roach, Baltimore, Md.

Clinic by N. T. Shields, New York, N. Y.

"Crib Attachments for Artificial Dentures." H. E. Kelsey, Baltimore, Md.

"Matrices in Plastic Work." G. E. Hardy, Baltimore, Md.

"A Gold Filling." H. D. Harper, Kinston, N. C.

"Filling Cavity on Distal Surface of Upper Bicuspids." J. S. Betts, Greensboro, N. C.

L. G. NOEL, *Chairman Program Committee.*

AMERICAN DENTAL SOCIETY OF EUROPE.

THE next annual meeting of the American Dental Society of Europe will be held at the Hamburger Hof, Hamburg, Germany, April 1 to 4, 1904.

CHAS. J. MONK, *Hon. Sec'y.*

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their annual meeting in the Coliseum building, corner Thirteenth and Olive streets, St. Louis, Mo., on the 25th, 26th, and 27th of August, beginning promptly at 10 A.M.

Telephone and telegraph offices in the building. Hotel accommodations will be secured for the members.

CHAS. A. MEEKER, *Sec'y and Treas.*

It is earnestly requested that all the secretaries of the Boards of Examiners throughout the states and territories mail to the secretary all changes in their respective boards, and greatly oblige

CHAS. A. MEEKER, *Sec'y,*
29 Fulton st., Newark, N. J.

NEW JERSEY BOARD OF REGISTRATION.

INTERCHANGE OF LICENSE.

THE National Board of Examiners, at its meeting at Asheville, N. C., last August, passed the following resolution:

"RESOLVED, That an interchange of license to practice dentistry be, and is hereby recommended to be, granted by the various state boards, on the following specific conditions:

"Any dentist who has been in legal practice for five years or more, and is a reputable dentist of good moral character, and who is desirous of making a change of residence into another state, may apply to the examining board of the state in which he resides, for a new certificate which shall attest to his moral character and professional attainments, and said certificate, if granted, shall be deposited with the examining board of the state in which he proposes to reside, and the said board, in exchange therefor, may grant him a license to practice dentistry."

It is important that every state board take up the matter at once, and if possible place it

by adoption upon their minute book, and be then prepared to act in this important matter of interchange of license should application be made.

The State Board of New Jersey has adopted the plan, and it is understood that Indiana and Ohio also have acted favorably upon it.

The New Jersey Board will be pleased to take this up with you and enter into a mutual understanding and reciprocity in this matter.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

MASSACHUSETTS BOARD OF REGISTRATION.

THE next meeting of the Massachusetts Board of Registration in Dentistry for the examination of applicants will be held in Boston, on March 9, 10, and 11, 1904.

Application blanks and all necessary information furnished by the secretary.

G. E. MITCHELL, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

BOARD OF DENTAL EXAMINERS OF CALIFORNIA.

THE Board of Dental Examiners of California will hold its next examination in San Francisco, commencing on May 23, 1904, and will also hold an examination in Los Angeles, commencing on June 13, 1904.

F. G. BAIRD, *Sec'y*.

NEW HAVEN DENTAL ASSOCIATION.

THE New Haven Dental Association will hold its annual convention in Harmonic Hall, New Haven, Conn., March 15 and 16, 1904.

A cordial invitation is extended to all ethical practitioners of dentistry to attend.

E. FRANK CORY, *Sec'y*, New Haven, Conn.

NEW JERSEY STATE DENTAL SOCIETY.

THE New Jersey State Dental Society will hold its annual convention in the Auditorium, at Asbury Park, N. J., July 21st, 22d, and 23d next.

Intending exhibitors should make application direct to the chairman of the Exhibit Committee,

Dr. W. G. CHASE, Princeton, N. J.

A GOLDEN ANNIVERSARY CELEBRATION.

CLASS OF 1854, PHILADELPHIA COLLEGE OF DENTAL SURGERY.

THE dental profession of Philadelphia, represented by all of its organizations, will celebrate on February 27, 1904, the fiftieth anniversary of the graduation of the Class of 1854 of the Philadelphia College of Dental Surgery by a complimentary banquet to the surviving members of the class, consisting of Drs. LOUIS JACK, JAMES TRUMAN, C. NEWLIN PEIRCE, W. STORER HOW, and ERI W. HAINES.

All dentists in good standing are invited to participate. The subscription price, including a banquet ticket and one copy of the souvenir historical volume to be published in commemoration of the event, has been fixed at ten dollars. The subscription list will be open until February 10, 1904.

The committee in charge of the celebration consists of the following members:

EDWIN T. DARBY,	G. L. S. JAMESON,
EDWARD C. KIRK,	J. D. THOMAS,
R. H. D. SWING,	WILBUR F. LITCH,
ALBERT N. GAYLORD,	H. C. REGISTER,
EARL C. RICE,	WM. H. TRUEMAN,
I. N. BROOMELL,	ROBERT HUEY,
J. T. LIPPINCOTT,	WM. L. J. GRIFFIN,
L. FOSTER JACK,	J. CLARENCE SALVAS,
D. N. MCQUILLEN.	

Applications together with the subscription may be forwarded to the chairman of the Invitation Committee,

ROBERT HUEY, D.D.S.,
330 So. Fifteenth st., Philadelphia.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

AT the regular meeting of the First District Dental Society of the State of New York, to be held Tuesday evening, March 8, 1904, at the Academy of Medicine, 17 West Forty-third street, New York city, a paper will be read by Dr. R. R. Andrews of Cambridge, Mass. Subject: "Calco-Globulin, and the Part It Plays in the Formation of the Dental Tissues in Health and Disease." The discussion will be opened by Prof. J. Bethune Stein of New York.

B. C. NASH, *Sec'y*.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE fortieth annual convention of the Connecticut State Dental Association will be held at Hartford, Conn., on Tuesday and Wednesday, April 19 and 20, 1904.

FREDERICK HINDSLEY, *Sec'y*, Bridgeport, Conn.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting of the New York State Dental Society will be held at Albany, May 13 and 14, 1904. A full program will appear later.

R. H. HOFHEINZ, *Pres.*, Rochester, N. Y.
W. A. WHITE, *Sec'y*, Phelps, N. Y.

CALIFORNIA STATE DENTAL ASSOCIATION

AND THE

ALUMNI ASSOCIATION OF THE DENTAL DEPARTMENT, UNIVERSITY OF CALIFORNIA.

THE California State Dental Association and the Alumni Association of the Dental Department of the University of California will meet jointly in annual session, May 16 to 19, 1904.

Eastern specialists on porcelain and orthodontia have been invited to give a course of instruction on their several subjects at this session, and efforts are being made to eclipse all previous sessions from the standpoint of progress and interest to the profession.

GUY S. MILLBERRY, *Sec'y Joint Com.*,
1202 Sutter st., San Francisco, Cal.

UNIVERSITY OF PENNSYLVANIA.

CONFERRING OF D.D.S. DEGREE.

By authority of a mandamus issued December 1, 1903, by the Board of Trustees, a University Council for conferring degrees was held in the College Chapel on Thursday, December 10th, at 1 o'clock, at which the degree of Doctor of Dental Surgery was conferred upon Edgar Thomas Blocher, Pennsylvania; George Frederick DeLong, Pennsylvania; Francis Isaac Ferris, Australia; Ramiro Enrique Gamez, Nicaragua; Henry Danvers Godden, New Zealand; Robert Roy Parks, Pennsylvania; Howard Lacey Letts, Iowa, and Harry Davis Winsmore, Pennsylvania.

JESSE Y. BURK, *Sec'y*.

VERMONT STATE DENTAL SOCIETY.

THE twenty-eighth annual meeting of the Vermont State Dental Society will be held at Hotel Pavilion, Montpelier, March 16, 17, and 18, 1904. We anticipate a pleasant as well as a profitable meeting, and a cordial invitation is extended to all.

THOMAS MOUND, *Sec'y*, Rutland, Vt.

SEATTLE DENTAL CLUB.

THE Seattle Dental Club—which has recently been reorganized—will hold regular meetings on the first Monday in each month at the Washington Hotel, Seattle, Wash., the features of the meetings to be social and clinical.

The last meeting was held at the offices of Drs. Burkhart and Palmer; various topics were discussed, after which lunch was served and a smoker indulged in.

C. A. CUSTER, *Pres.*,
A. B. PALMER, *Sec'y*.

EASTERN DENTAL SOCIETY OF NEW YORK CITY.

THE twenty-fourth regular monthly meeting of the Eastern Dental Society was held on Thursday, January 7th, with a large attendance. The main feature of the evening consisted of a lecture delivered by Prof. Alfred R. Starr, of the New York College of Dentistry, on "The Treatment of Devitalized Teeth." The members were glad to meet their former teacher and listen to his well-delivered and instructive lecture on a subject of so much interest to the dental profession.

Prof. Starr spoke for over an hour, touching briefly on every part of the subject. In speaking of materials for root-fillings he laid special stress on the necessity of filling the canals of devitalized teeth with non-absorbing material. "Years ago," he said, "I thought that cotton saturated in creasote was a good filling material, but the troubles that followed this method taught me the reverse. What I now prefer are small pieces of gutta-percha which I can carry with an instrument to the very apex of a root, making sure by measurements that it reaches its destination. I prefer small pieces to the points, for they are sure not to turn upon themselves while

soft, thus insuring a faultless root-filling." In speaking of opening the cavity and pulp-chamber of a tooth he said: "Many dental practitioners cut away as little as possible of the tooth-structure while treating devitalized teeth. I believe it much better to open the tooth freely and remove all the contents of the roots, and then to fill it conscientiously, knowing that I have done my best. Is it not better to sacrifice a part of the tooth and make all things sure than to work in the dark with all the chances in the world of having trouble in the future?"

Many useful points were brought out by the eloquent and able speaker during the lecture, and at the conclusion a vote of thanks was unanimously and enthusiastically extended to him.

The next regular monthly meeting of the Eastern Dental Society will be held Thursday, February 4, 1904.

JOS. SOOKNE, *Sec'y.*

NEW YORK ODONTOLOGICAL SOCIETY.

THE annual meeting of the New York Odontological Society was held at the New York Academy of Medicine, 17 West Forty-third street, New York city, on December 15, 1903, with the president, Dr. J. F. P. Hodson, in the chair.

The officers elected for 1904 were as follows: John I. Hart, president; F. T. Van Woert, vice-president; Wm. B. Dills, recording secretary; W. D. Tracy, corresponding secretary; F. C. Walker, treasurer; F. O. Kramer, curator; Ellison Hillyer, editor. Executive Committee—W. D. Tracy (chairman), B. C. Nash, W. J. Turner. Clinic Committee—R. M. Sanger (chairman), H. W. Gillett, A. H. Merritt.

DISTRICT OF COLUMBIA DENTAL SOCIETY.

THE District of Columbia Dental Society held its annual meeting December 16, 1903, at Rauscher's, where a banquet was given, and new officers installed as follows: Wm. D. Monroe, president; S. W. Bowles, vice-president; Charles Diedel, corresponding secretary; A. J. Brown, recording secretary; M. F. Finley, treasurer; H. C. Thompson, librarian.

A noteworthy feature of the evening was

the presentation by Dr. Emory A. Bryant to Dr. W. D. Monroe, the president, of a beautiful gold-mounted gavel.

The following toasts were responded to, Dr. A. J. Brown acting as toastmaster: "International Dental Congress," Dr. M. F. Finley; "Dental Education," Dr. Emory A. Bryant; "Our Local Society," Dr. H. C. Thompson; "The Coming Dental Meeting," Dr. J. H. London; "The Ethical Dentist," Dr. A. D. Weakley; "The Social Dentist," Dr. T. J. Jones; "The Young Practitioner," Dr. M. Davis; "Harmony," Dr. D. N. Rust.

FRATERNAL DENTAL SOCIETY OF ST. LOUIS.

THE Fraternal Dental Society of St. Louis, at its December meeting, elected the following officers for 1904: E. E. Haverstick, president; W. E. Brown, vice-president; E. P. Dameron, recording secretary; J. A. Todd, corresponding secretary; S. T. Bassett, treasurer. Executive Committee—B. L. Thorpe, chairman; W. L. Whipple, G. H. Mathae.

JAMES A. TODD, *Sec'y.*

4109 Manchester ave., St. Louis, Mo.

ARMY DENTAL CORPS.

PAR. 5, S. O. 236, C. S., from these headquarters, is amended so as to direct that Contract Dental Surgeon Edwin P. Tignor, upon completion of temporary duty at Fort Sill, O. T., will, instead of returning to Fort Riley, Kan., proceed to Jefferson Barracks, Mo., for temporary duty for such time as may be required not to exceed one month. (December 24, D. M.)

Contract Dental Surgeon Frank P. Stone, now on sick leave at Macon, Mo., is relieved from further duty in the Division of the Philippines, and upon the expiration of said leave will proceed to San Francisco, for duty at the Presidio of San Francisco, to relieve Contract Dental Surgeon William G. Hammond, who will report in person to the commanding general, Department of California, for transportation to the Philippines. (December 29, W. D.)

Leave for three months is granted Contract Dental Surgeon Charles J. Long, to take effect when relieved from duty in the Philippine Islands. (December 30, W. D.)

PUBLISHER'S ANNOUNCEMENT.

CONCERNING THE DISTRIBUTION OF SAMPLE COPIES.

SOME of our friends have asked us why we are not more generous in the distribution of free copies of the DENTAL COSMOS, especially in institutions devoted to dental education. We beg to state in explanation that a publication, in order to be admitted to second-class postage privileges, must confine itself strictly to the regulations of the Postal authorities in reference thereto, or evade or violate the law, which the publisher of the DENTAL COSMOS has neither the intention nor disposition to do.

In a ruling by the Third Assistant Postmaster-General, under date of December 2, 1902, and published in the United States *Official Postal Guide* for June 1903, pages 11-13, the status of second-class mail privileges is set forth in unmistakable language. After defining what constitutes a "legitimate list of subscribers," the ruling referred to provides for the distribution of "sample or free copies" in equal ratio to such sub-

scription list under the following conditions and restrictions:

PAR. 11 (b): "An equal number of sample copies, but no more, to persons who are not subscribers for the purpose of inducing them to subscribe for, advertise in, or become agents for the publication, and for such purposes only; provided each sample copy is plainly marked 'sample copy' on the exposed face of the publication or its wrapper, or on the wrapper or the package which may contain a bulk number of sample copies."

PAR. 12: "It is not permissible to send sample copies to the same persons at the pound rate of postage in excess of three times, consecutively or otherwise, during any one calendar year."

PAR. 14: "The regular or continuous circulation of sample or free copies in excess of the number provided for in paragraph 11 (b), *by mail or otherwise*, or the sending of sample copies *continuously* to the same persons in excess of three times, *consecutively or otherwise*, during any one calendar year, *even though postage on the excess be paid at the transient rate*, will cause the publication to be deprived of its second-class status."

THE S. S. WHITE DENTAL MFG. CO.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING DECEMBER 1903.

December 1.

- No. 745,615, to CLARENCE A. HOLMES. Process of making dental dies.
No. 745,682, to MILTON H. SHOENBERG. Electrical water heater.
No. 745,722, to CHESTER M. FREEMAN. Dental tool.

December 8.

- No. 746,380, to FRANK M. RICHARDSON and JOHN F. FIELD. Apparatus for administering anesthetics.

December 15.

- No. 746,804, to LEO E. EVSLIN and GEORGE OTT.

Means for fixing artificial teeth to dental plates.

December 22.

- No. 747,364, to GEORGE L. BENNETT. Vaporizer for anesthetics.
No. 747,484, to ERWON S. RINEHART. Dental dam holder.
No. 747,742, to EDWIN MARSHALL. Anesthetic-inhaler.
No. 747,800, to GUSTIN B. STONE. Process of molding and biscuiting articles.

December 29.

- No. 748,565, to GUSTIN B. STONE. Swager.



DR. J. H. BATCHELDER.

THE DENTAL COSMOS.

VOL. XLVI.

MARCH 1904.

No. 3.

ORIGINAL COMMUNICATIONS.

NOTES ON THE EROSION OF THE TEETH.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin.

THE question of the cause of the erosion of the teeth is one of the most puzzling with which the dental scientist has had to grapple, and among the different theories that have come forward it cannot be said that any one has as yet succeeded in satisfying a majority of the disputants.

The exfoliation theory, the chemical, electro-chemical and chemico-mechanical theories—among which the view of Michaels, that erosion is due to the action of potassium sulfocyanid is to be included—the mechanical theory, the uric acid theory, and finally the idea that erosion is due to the solvent action of some ferment in the mouth, have all had, and in part still have, their supporters; but no one of them has succeeded in permanently establishing itself.

Recently this question has been brought to the front again by the communications of Dr. Kirk, who has attacked it in an altogether new and original manner, and has brought out some results deserving of the closest consideration. The reader is referred to the original communications.

It is not my object at this time to enter the ranks of the disputants. I shall confine myself strictly to the subject indicated in the title of this article, in reproducing a few notes, observations, and experiments that I have made from time to time on the subject under consideration, emphasizing some points which appear to me to be fairly well grounded and which I think should not be lost sight of in future arguments.

SOME CASES OF EROSION.

(I) Erosion is an effect observed in healthy teeth with living pulps, as well as on pulpless teeth and on natural teeth worn as pivot teeth or on artificial bases.

A well-marked case of erosion (Fig. 1) developed in the course of two years on a piece of ivory which I had set with cement in an erosion cavity in a lower right first bicuspid. (See *Independent Practitioner*, 1888, page 328; also an article by Howe in the April 1893 issue of the same journal.) Erosion likewise attacks amalgam as well as gold fillings. A typical case came under my observation some years ago.

The patient, a man of about forty-five years, was in fair health with the exception of an occasional attack of asthma and a rheumatic tendency. The erosion

FIG. 1.



Erosion of an ivory inlay (a). The dotted line shows shape and size of inlay at the time of insertion.

was most extensive in the front of the mouth, growing gradually less toward the back, the third molars being quite free. The facial surface of the six front teeth in particular, as well as the cutting edge or cusp, was completely denuded of enamel, and also a fair amount of dentin had been lost, the two surfaces meeting in a sharp edge about at right angles. (Fig. 2.) On closing the mouth there

FIG. 2.



was a space about one-fifth of an inch wide between the upper and lower rows of teeth. The teeth were exceedingly sensitive to the excavator as well as to changes of temperature and to fruit juices.

In the year 1880 the surfaces of all the teeth were restored with gold, which was well hammered and built down (or up) almost enough to restore the articulation. In the course of five to ten years the gold was for the most part completely worn away, both from the facial surface and cutting edge, although the teeth at last did not come together to within one-fifth of an inch, in some of the teeth only the gold in the retaining points and grooves being left. In the upper teeth the gold, dentin, and enamel were all wearing away at the same rate, neither of these substances projecting above the others; whatever the cause of

the erosion in this case, it affected all three substances about equally, on the cutting edge absolutely equally. Strangely enough, about the year 1895 the sensitiveness disappeared, and the wearing away both of tooth-substance and fillings became very much less marked, the patient himself attributing the change to a severe attack of influenza, which he said had also cured two of his friends who were affected in the same way.

Another interesting case was presented by Mrs. H., aged forty-three years. The upper right central, having a wedge-shaped defect near the gums, had been

FIG. 3.



FIG. 4.



filled with gold. At the time I examined it the filling was cut into halves in the manner indicated in Fig. 3. The neighboring incisors showed deep step-shaped defects as seen in Fig. 4. These and similar cases indicate the action of some powerful mechanical factor, apparently independent of any acid. Porcelain fillings do not appear to suffer from erosion, while the tooth-substance disappears around them as in gold or amalgam fillings.

CHEMICO-MECHANICAL THEORY OF EROSION.

(II) One of the most widespread theories which attempts to account for erosion is the chemico-mechanical, which requires a decalcifying action of the buccal secretions, followed by the brush or some other mechanical agent. The following observations are deserving of consideration in connection with this theory. In grinding sections of carious teeth we invariably have the greatest difficulty in getting the carious (decalcified) portion sufficiently thin for microscopical examination without completely grinding away the undecalcified portions. The enamel grinds down fastest, then the normal dentin, and finally, much more slowly

and with much greater difficulty, the carious dentin. It is also a universal experience that brittle substances are ground down much more easily than tough, leathery ones. We might grind for ages with a smooth stone on a piece of rubber tubing and still not grind it away. I have seen a case in which a cavity of erosion followed by decay in a lower left first bicuspid had been filled with gutta-percha, and in which the erosion reappeared around the margin of the filling, wearing away both enamel and dentin, above which the gutta-percha filling projected. If we insert a gold filling in a block of ivory and apply a brush with sharp tooth-powder to it, we will find that the dentin wears away faster than the gold, although it is considerably harder. I have repeatedly made the experiment of suspending a block of ivory in a weak solution of lactic acid, so that about half of the block is immersed, removing it every twenty-four hours and brushing it parallel with the line of immersion with an ordinary tooth-brush carrying a tooth-powder to which about five per cent. of pumice had been added. I found without exception that the un-immersed half wore away more rapidly than the half which was subjected to the action of the acid.

May it therefore not be possible that decalcification, instead of being an aid, might be a hindrance to the progress of erosion?

DOES EROSION OCCUR AMONG THE UNCIVILIZED RACES?

(III) In the *Independent Practitioner* for 1884, page 40, I gave an account of an examination which I had made of some 900 skulls in the anatomical museum of the University of Berlin. In this collection are to be found skulls from all parts of the world and from all ages. I did not find among the skulls of uncivilized races a single sure case of that form of erosion which has been designated as "wedge-shaped defect." This is a fact of considerable significance, to which I again call attention, after the lapse of eighteen and one-half years, in

the hope that others may be induced to make similar examinations. The question as to whether erosion occurs among uncivilized races ought to be definitely settled, which I do not consider to be possible through the study of the specimens of one museum alone.

MECHANICAL FACTORS DETERMINING THE FORM OF CAVITIES OF EROSION.

(IV) The form which cavities produced by erosion assume may be explained, on taking the mechanical factor into consideration, by the form and position of the neighboring teeth, which determine the line in which the bristles of the brush act most vigorously, and in part also possibly by the form of the brush itself, as well as by the physical structure of the tooth.

If we brush a slab of ivory, in which the alternating transparent and opaque parallel lines are plainly marked, with brush and powder, parallel to the direction of those lines, we find it wearing away in grooves. There is a lower denture with ivory base and human teeth in the collection of the Dental Institute of Berlin, which shows the same deep parallel grooves, as well as erosion of the teeth at the necks, caused presumably by the brush used in cleansing the denture after meals.

In this journal for 1890, page 253, in a short article on the action of hydrogen dioxid on the teeth, I refer in a note to experiments showing the intense action of certain alkaline substances—in particular caustic potash—upon the teeth, which cause a complete disintegration of dentin by dissolving out the organic substance. The question is then brought up "whether there may not be other substances in the human mouth under certain conditions which, in the course of years, may in a similar manner, dissolve out the organic basis-substance of the teeth, leaving the friable tissue to be worn away mechanically. Attempts to account for erosion by the action of decalcifying agents have thus far not led to a satisfactory solution of the question, and it might be well in future, while

searching for the cause of erosion, to bear in mind that the teeth may be acted upon by agents which attack primarily the organic, as well as by those which attack only the inorganic constituents."

This suggestion has recently acquired an increased importance because of the publications of Arkövy* and Preiswerk,† who have advanced the idea that certain alkaline substances, and in particular certain bacterial ferments of the nature of trypsin, in the presence of an alkaline reaction may bring about a disintegra-

tion of tooth-substance resembling the chronic form of caries. On this I reserve my opinion until experiments now under way shall have been completed.

The tendency of the above notes is to emphasize the importance of the mechanical factor in erosion, to throw a certain doubt upon the necessity of the concomitant action of an acid factor, and to suggest anew the possibility of an alkaline factor, while not as yet expressing my own view as to the actual existence of such a factor.

PRINCIPLES UNDERLYING THE INSERTION OF PROXIMO-OCCLUSAL GOLD FILLINGS IN BICUSPIDS AND MOLARS.

By C. N. JOHNSON, L.D.S., D.D.S., Chicago, Ill.

(Read before the New York Odontological Society at its anniversary meeting, January 19, 1904.)

THOUGH it would sometimes seem that this subject had been discussed to the extent of leaving nothing more to be said upon it, yet its importance as a factor in the preservation of the natural teeth merits so clear an understanding of the principles involved in the performance of the operation, that what might otherwise appear a tiresome and needless repetition becomes permissible. As stated by Dr. M. L. Rhein in a paper read before the Academy of Stomatology of Philadelphia, and published in the *International Dental Journal* for September 1903, "The member of the profession whose life is spent day by day, hour by hour, in untiring efforts to preserve man's dental organs, can never fail to find this subject interesting and inspiring."

It is in this spirit that the subject is brought before you at the present time, not with the idea of introducing something new or novel, but merely to consider some of the fundamentals of the operation, and to discuss several features

upon which there seems to be, among men of discernment in the profession, a slight difference of opinion.

OBJECTS OF A FILLING.

At the outset there should be a definite understanding of the objects to be gained in the insertion of such a filling, and this followed by a study of the best and simplest means of bringing about the desired result. The first object in the insertion of any filling in a carious cavity in a tooth is to seal the cavity against leakage. A leaky filling may not immediately lead to failure, but if the leak be great enough to admit the micro-organisms of caries it is only a question of time when decay will take place around the filling. The next object is to anchor the filling securely against movement under the stress of mastication; the next to protect the cavity margins against disintegration of the enamel rods surrounding the filling; the next to make a filling sufficiently dense so that there will be no compression of the filling material under ordinary stress; and last, but in the class of cavities under consideration by no means least, maintenance of proper contour to preserve the interproximal

* *Oesterreich-Ungarische Vierteljahrsschrift für Zahnheilkunde*, 1901, p. 231.

† *Ibid.*, 1902, p. 433.

space in its normal form, and afford protection to the gum tissue lying in it.

In the fulfilment of these objects there are two chief considerations to be observed—the preparation of the cavity, and the insertion and finishing of the filling. It is manifestly impossible in the brief space allotted to one paper to consider the entire operation in detail, and we must content ourselves with a mere glimpse at some of the more prominent features, and try to study the chief essentials to success.

PREPARATION OF APPROXIMAL CAVITIES.

When decay begins on the approximal surface of a bicuspid or molar it usually spreads from the initial place of penetration near the contact point till the outlines of the cavity extend rootwise under the free margin of the gum, occlusally till the occlusal surface becomes involved, and bucco-lingually till an explorer will catch on the margins of the cavity when passed over the surface of the tooth in these regions. This leaves a cavity somewhat curved in outline, with the convexity of the curve along the gingival wall presented toward the alveolar process. It is becoming quite generally recognized that in the preparation of such a cavity the best results are to be obtained by changing the gingival curve to a horizontal line, thus accomplishing two objects. These objects are both important so far as the permanence of the filling is concerned, and relate to the prevention so far as possible of a recurrence of decay at what has become known as the vulnerable points of such a filling—the gingivo-buccal and gingivo-lingual angles—and to the greater stability of a filling seated on a flat base over one seated on a curve.

PREPARATION OF GINGIVAL WALL.

It is not the present intention to go into the details of cavity formation, but one small matter must be mentioned on account of an apparent misconception on the part of some in connection with it. When a flat gingival wall is advocated it is not meant that the marginal outline of this wall should join the marginal

outlines of the buccal and lingual walls at sharp right angles. There should invariably be a short curve instead of an abrupt angle to the enamel where one wall joins another. But in the interior of the cavity, or in other words in the gingivo-axio-buccal and gingivo-axio-lingual regions the walls may join at sharp right angles. And this is the entire extent to which any undercutting or grooving need ever be carried in this region for the greatest stability to the filling and the readiest possible means of starting the gold. No grooving in the ordinary acceptance of the term is ever necessary.

The buccal and lingual walls should be as nearly as practicable parallel, and they should join the axial wall at right angles up to a point near the occlusal surface where the curve of enamel arching over the cusps interferes with such a form. The anchorage step in the occlusal surface should have a flat base, and the surrounding walls of the step should rise parallel from this base. The enamel margins should be beveled in the regions where there is danger of the peripheral ends of the rods being left unsupported and likely to subsequently crumble and cause a leak around the filling.

It will be noted that in this form of cavity there are no deep undercuts or grooves, and no small pits for the purpose of starting the gold. It is deemed wholly unnecessary to resort to pits for starting gold fillings unless cohesive gold is used from the beginning to the end of the filling, and it is one of the objects of the present paper to try to prove the desirability of employing non-cohesive gold at least in the early stages of the operation.

NON-COHESIVE GOLD AT CERVICAL WALL.

If it is true that one of the chief objects in filling such a cavity is to seal it against leakage, then the readiest means of sealing it becomes a matter of considerable importance, and the fact that non-cohesive gold may be more easily adapted to walls and margins than cohesive commends it to our attention. By this statement it is not intended to imply that cavities cannot be successfully sealed

with cohesive gold. It has been demonstrated repeatedly that cohesive gold may be adapted perfectly to cavity walls, and yet this does not alter the general proposition that for this purpose non-cohesive gold is far superior. If we study the characteristics of the two forms of gold we shall soon discover why this is true. Cohesive gold, as its name implies, is gold of which two or more sheets when brought into intimate contact will cling together and become one piece. In other words, they will weld cold under pressure. This welding property of gold is of very great advantage in making a strong filling and in building fillings out into contours, but it correspondingly detracts from the ease with which such gold may be closely adapted to cavity walls. The greater the tendency of the layers of foil to cling together the greater the difficulty in forcing the layers across each other to make them assume a new relation one to the other so as to bring them into intimate contact with the walls of the cavity. In fact, to secure perfect adaptation of cohesive gold it must be used in relatively small pellets, and all expert gold manipulators have long since recognized this. To insert a large filling of the type under consideration entirely of cohesive gold, and to be assured of perfect condensation and perfect adaptation throughout is necessarily a very exacting and wearisome operation. With the nervous organization of many of our patients of the present day such an operation is in most cases ill-advised, to say nothing of the matter from the dentist's point of view.

The plan suggested by Dr. Rhein to overcome this difficulty, viz, dividing the operation into several sittings by inserting a portion of the filling, and then sealing the remaining cavity with gutta-percha and dismissing the patient till another appointment, thus making the filling in sections, has to the mind of the writer some serious disadvantages. It is too much in the nature of making several bites of a cherry which should be taken in one. It is a matter of more or less aversion with the average patient to have the rubber dam applied, and to

multiply this operation several times for the insertion of one filling seems hardly desirable if there is any way of avoiding it. Then again, when the surface of gold in the incomplete filling becomes moist, as it must by this procedure, or becomes contaminated by packing the gutta-percha over it, its cohesion is destroyed and there is no process or method of manipulating the gold on this surface which will ever bring it back quite to the condition it was in at the moment the plugger left it. While a filling inserted in this way by a painstaking and skilful operator will undoubtedly do good service it can never be so perfectly homogeneous as if it had been inserted at one sitting, and the aggregate amount of time spent in the several sittings will be appreciably greater owing to the necessity of repeated preparation for the operation in the way of applying the rubber dam and other minutiae.

It may be said in passing that with cavities so very large that the insertion of the gold at one sitting will prove too great a tax on either the patient or operator there is a better means of managing such cases, a means which is daily assuming a wider range of usefulness as we become more familiar with its possibilities. This is through the medium of gold inlays—a subject which, though not up for discussion at this time, must be reckoned with in studying the class of cavities under consideration.

COMBINATION OF NON-COHESIVE WITH COHESIVE GOLD.

But it is confidently believed that there are very many cavities which can readily be filled by employing a combination of non-cohesive gold with cohesive, which with cohesive alone would prove too taxing. As has already been intimated, non-cohesive gold may be used in larger masses than cohesive, and with the assurance that these masses may be carried to place so as to perfectly fit the cavity walls and to lie in the most intimate relation one to the other. The fact that the layers of foil in a non-cohesive cylinder will slide across each other under pressure without cohering renders it pos-

sible to force the gold into the most inaccessible angles and corners of the cavity and also to compress the various layers into the closest possible coaptation with each other. The force of the plugger impact is conveyed through a larger mass of gold and to a greater distance because it is not interfered with by cohesion of the particles.

It is for this reason that an operation may be very materially shortened by employing non-cohesive gold in certain parts of the filling where adaptation is of the greatest importance, and where there is no attrition in the process of mastication. The gingival third or even half of some of these fillings may be made of non-cohesive gold with the best possible results in very much less time and with less exertion than if cohesive gold were used throughout, and the fact that the method is effective is amply demonstrated by the existence of many such fillings doing good service and saving the teeth for years. It is not claimed that a filling thus made is of equal hardness throughout to one made exclusively of cohesive gold. If for any reason it ever becomes necessary to drill into such a filling it will be found that after the drill has laboriously forced its way through the cohesive gold it will at once sink into the non-cohesive gold and bur it out without difficulty. This naturally gives the impression of softness, and, in the minds of some operators leads to a doubt as to the stability of a filling so constructed.

But if the philosophy of the subject be studied it will be seen that this particular kind of softness is not so objectionable as it would appear in the positions where non-cohesive gold is properly indicated. The only thing we have to guard against in these positions is compressibility. If this apparently soft mass would compress under the impact of force brought to bear upon it by stress against the cohesive gold lying over it, we would then assuredly have a failure of the filling, and it may be said parenthetically that fillings have failed in the past through this cause where the covering of cohesive gold has been too shal-

low and the non-cohesive gold has not been perfectly condensed underneath it. There is positively no danger of compression or movement of the non-cohesive gold provided it is anchored on a flat base with parallel perpendicular walls such as has been advocated for the cavities under consideration, and also that the gold is made perfectly dense by the proper placing of the non-cohesive gold, the proper arrangement of the layers of foil constituting the rope, cylinder, or pad which is being employed to start the filling, and by the requisite degree and character of plugger impact to thoroughly condense the gold and leave no air spaces throughout its structure. If the layers of foil are brought into intimate contact with each other and with the cavity walls the gold so placed will sustain all the force necessary to make a stable filling, and if it is not built out to where it is subjected to attrition or to a leverage stress so as to be endangered by a break there is no element of weakness in its construction.

In speaking of the arrangement of the layers of foil it is meant that where ropes are used for starting fillings they shall be sufficiently thick so that when laid on their side along the gingival wall the layers constituting the rope shall reach from the axial wall across the gingival wall and extend beyond to the extreme approximal surface of the finished filling, and if cylinders are used that they shall be large enough so that no matter which way they are laid on the gingival wall they shall reach well across it mesiodistally. This insures a continuity of structure to the filling, which prevents flaking or crumbling and permits of the closest possible relationship of the layers.

TECHNIQUE OF THE OPERATION.

In the technique of this operation the details are somewhat different from those in the insertion of an exclusively cohesive filling, and it may be well to consider briefly some of the more prominent features of distinction. In the starting of a filling with non-cohesive gold, hand pressure becomes an important adjunct, and this supplemented by

a few blows of a heavy soft mallet will be all that is necessary in carrying the non-cohesive gold to place previous to the introduction of cohesive gold over it. A light or rapid mallet is contra-indicated with non-cohesive gold, for the reason that such a mallet does not have condensing power sufficient for a mass of gold as large as is usually indicated in starting the class of fillings under consideration. What is most needed is to have the impact carried some distance beyond the immediate point of application, and this can only be accomplished by a heavy soft mallet. With a light hard mallet the energy is concentrated at the point of impact and so does not extend far beyond the serrated end of the plugger. This is an excellent blow for condensing gold in small pieces and for hardening the surface of the filling, but with non-cohesive gold the only result is to chop it up into a disintegrated mass. To condense non-cohesive gold it requires very few movements with hand pressure and very few blows of the mallet, but the force of either hand pressure or mallet blow must be appreciable. It must be driven to place with vigorous thrusts, and the efficacy of the thrust is greatly accelerated if when the pressure is brought to bear it is supplemented by a wrist movement whereby the handle of the plugger is made to describe the short arc of a circle. This movement forces the gold into the most intimate contact with the walls of the cavity, besides facilitating the operation by pressing the gold laterally away from the shank of the plugger so that it may be withdrawn without dragging the gold from the cavity. For condensing non-cohesive gold in this way pluggers with a broad end and deep serrations are indicated, so that the plugger point does not puncture the gold and disintegrate it and so that the surface is not left too smooth to admit of the attachment of cohesive gold to it. The first pieces of cohesive gold should be well annealed and driven into the structure of the non-cohesive, so that the attachment may be made by an interlacing of the two forms of gold rather than by depending on cohesion.

From this point to the completion of the filling the operator may use any form of mallet best adapted to his individual needs. In cavities easy of access the filling may be built more quickly by the rapid mechanical mallet or the electric mallet than by any other means, but there is one feature in the use of these mallets which must be recognized to insure success in their use. They do not carry the impact far beyond the serrated end of the plugger, and they cannot be used for condensing thick pieces of gold, besides, the velocity is so great that the molecular tension of the gold is rapidly raised to the point of interfering with its cohesion. It will be noticed that if a rapid mallet is allowed to play for any time on the surface of a filling it is difficult to make another pellet cohere to it, and this has been the means of causing many operators to discard this form of mallet. With those who use these mallets successfully there has been a close study of their peculiarities in this regard, and a quick intuition which teaches the operator the precise moment to cease malleting. In the hands of an expert in their use it is possible to do the very best work with them, and they are especially adapted to giving a satisfactory surface to the filling. It is of course desirable, with fillings subjected as these are to the full stress and attrition of mastication, to obtain the hardest possible surface, and the rapid mallets are peculiarly fitted to accomplish this. It is a well-known fact that gold may be appreciably hardened even after full density has been reached by repeated mallet impact, and the character of the blow struck by a rapid mallet is an ideal one for this purpose. If a mallet of this kind be allowed to play over the surface of such a filling for any time it will soon be found that the gold will ring almost like steel, and the result will be the best possible wearing surface that can be given a gold filling.

MAINTENANCE OF THE INTERPROXIMAL SPACE BY CONTOURING.

In studying the question of contour and the best means of maintaining the

interproximal space in its normal form we approach one of the most important considerations connected with the subject. Patients today with their highly wrought nervous organisms are complaining more and more of the irritation produced by the wedging and lodgment of fibrous food between the teeth, and unless we rise to the necessities of the case and make our fillings so that the teeth are comfortable for mastication, we are falling short of our true function as dental operators.

As a guide to the form which should be given fillings on their approximal surfaces, it is well to study somewhat closely the natural form of the teeth previous to decay. If this be done it will be found that the actual area in contact between normally formed human teeth is exceedingly small, and when we look into the philosophy of this we shall see that there is an excellent reason for it. The food of man is diversified, and certain varieties of it are fibrous in nature. In the mastication of this fibrous food it is inevitable that occasionally some of the fibers will be forced between the approximal surfaces of the teeth, and if the contact is broad the fibers will be retained to cause discomfort to the patient and induce decay in the approximal surfaces. It is precisely this which occurs when flat surfaces are left to fillings, and many cases of recurrent caries around fillings otherwise perfect may be traced to this.

In making these fillings they should be built out boldly into close contact with the adjacent tooth as they approach the occlusal surface, and this rounded outline should not be destroyed or cut away in finishing the filling. It is of course necessary in inserting the gold, whether a matrix is used or not, to build a slight excess of the material over the margins to be assured of perfectly protecting the enamel, and this excess must subsequently be trimmed away to a symmetrical conformity with the original outline of the tooth. In doing this great care must be exercised not to cut away the contact point and make it flat, and this may readily be accomplished in the following manner: Leaving the gold full

and tight against the contact point of the approximating tooth, attention should first be directed to finishing the filling in the interproximal space. No attempt should be made to pass anything between the contact points at this stage of the operation, whether strips, disks, or other accessories, and the approach to the interproximal space should be made from the buccal aspect. A thin burnisher should first be used to smooth the gold and burnish it over the margins, and if when this is done it is found that there is much excess of gold to be dressed away it may best be done with narrow files or keen-bladed trimmers. When the gold is nearly to form, a narrow finishing strip, inserted from the buccal aspect, may be used to complete the work and put on a desirable finish.

The filling now presents with the gingival portion in the interproximal space perfectly polished and in proper outline, so that the separator may readily be adjusted to gain space for finishing the remaining portion of the approximal surface. If the filling is wide bucco-lingually so as to expose the gold well in these directions, a sandpaper disk may be used to finish the buccal and lingual margins as they round up over the cusps, but it should not be allowed to play between the contact points through fear of flattening the gold. The object should be merely to round the gold at the contact point and polish it without cutting it away. This can best be accomplished by first forcing a broad and very thin steel instrument like the Dunn hand matrix or the Thorpe flexible spatula back and forth between the contact points to smooth the gold and make room for a wide and fine-grit finishing strip. The object of having it wide is so that it will cover the entire surface of the filling in this region and not impinge at any one point exclusively, and it should be fine so that it will merely smooth and polish the surface instead of cutting it away. By this means a marble-like contact may be made between the filling and the approximating tooth, the two knuckling tight together when the separator is removed.

FINISHING THE OCCLUSAL SURFACE.

The finishing of the occlusal surface of the filling is a simple matter which may well be left to the individual methods of each operator, the only suggestion being that in those cases where the cusp of the opposing tooth is likely to exert a wedging force upon the filled tooth tending to split it, the cusp should be ground shorter and somewhat flattened on its tip to insure greater safety to the filling and to the tooth containing it.

In concluding what is already too long a paper your essayist cannot forbear mentioning one further point connected with the wedging of food between teeth. It will occasionally be found that even with teeth filled as carefully as we may

there is complaint on the part of the patient from this cause. In fact we find teeth which have never been filled and in which the contact seems perfect giving trouble. In cases like these it will usually be found that the relation of the occluding tooth is such that a sharp cusp is projected on closure of the mouth against the point where the two affected teeth are in contact, in such a way as to spring them slightly apart and force the fibers between them. If there be doubt of this, a bite taken of the teeth and a plaster cast made will usually reveal it. The remedy is to grind the offending cusp away very freely, a procedure which in the experience of the writer has been the means of bringing relief to a great many suffering patients.

EXPERIMENTS IN VULCANITE TO PREVENT VERTICAL CONTRACTION.

By Dr. STEWART J. SPENCE, Chattanooga, Tenn.

AT the outset of this article the writer is confronted by a difficulty in choosing terms to express correctly that contraction which takes place in the length or breadth of a plate and that which occurs in its thickness; and in adopting *vertical* for the latter and *areal* for the former he employs these terms as serving our purpose when thus defined, rather than as claiming their correctness.

Areal contraction of a vulcanite plate is more or less prevented by the contact of plaster with the plate, but vertical contraction has no such restraint; it takes place between two walls of plaster. The vulcanite would be free to shrink from both walls were it not bound to one of them by the teeth, which are imbedded in said wall. If the teeth are sufficiently bulbous or bell-shaped to remain fixed in the investing plaster after it has been softened during vulcaniza-

tion, the total contraction (which occurs in cooling) takes place at the expense of the other side—that is, of the wall of vulcanite covering the ridge of the model. A plate so contracted will, other things being equal, press unduly on the palatal dome and insufficiently on the ridge.

As uncontrolled shrinkage of vulcanite is about 0.5 mm. to the inch, a plate half an inch thick at its ridge would there shrink 0.25 mm., and as this is about equal to 15 folds of No. 20 tin foil it is clear that the adaptation of such a plate will thereby be very seriously injured.

Vertical contraction tends also to increase areal contraction; for it removes the wall of vulcanite from close contact with the wall of plaster, and so permits the vulcanite to more freely creep across the surface of the plaster. At least, this appears to be a necessary theoretic deduction.

EXPERIMENTS ON THE CONTRACTION OF VULCANITE.

About half a year ago the writer published an article giving a record of about twenty experiments in vulcanite and its contraction,* showing that a bar of this material three inches long by one-quarter inch thick will contract in length while cooling about 1.5 mm.

With this knowledge obtained, he desired to know the contractile force of such a bar, and with this object he has lately made the following experiment:

Taking a bar of vulcanite of the above-mentioned dimensions, and that had not yet undergone contraction (for contraction while cooling in the vulcanizer is prevented by the rubber slightly exuding at the lid of the little metal box in which it is held for vulcanization and becoming entangled in the wire which binds the lid to the box), he tied a weight to one end, and by a string tied to the other end of the bar suspended it and the weight in boiling water for about a minute, this being sufficient time to raise the temperature of the vulcanite to that of the water. The whole was then removed from the hot water and cooled by pouring on it cold water while still suspended. It was found that a 2-lb. weight slightly increased the length of the vulcanite bar, a 1-lb. caused no perceptible change, and a $\frac{1}{2}$ -lb. weight permitted a small contraction—about 0.5 mm.

The bar was then thrown loose into boiling water, and on being cooled again was found shrunken 1.5 mm.—about $\frac{1}{16}$ inch. In the vulcanizer, though falling from the much higher temperature of 320° F., the contraction is but a little more than this.

By this experiment it was proved that vulcanite contraction can be prevented by a slight strain. How to prevent contraction in the vulcanizer was the question—or rather, how to prevent *vertical* contraction; for areal contraction can be controlled by the use of a sufficiently firm investment.

TO PREVENT VERTICAL CONTRACTION.

As the result of many months of cogitation on this question I have thought up three feasible methods, viz—(1) To use the long-rooted teeth made for continuous-gum work, trusting to their serrated roots to hold apart the two walls of vulcanite. (2) To drill pits in the model which, by filling with spurs of vulcanite, will bind the plate to the model. (3) To use U-shaped forms of serrated wire, imbedding them in the vulcanite, instead of the long-rooted continuous-gum teeth.

To these may be added a fourth—weighted rubber, which contracts about 40 per cent. less than other rubbers. If there were no better way to meet the enemy, this would certainly be of value as a palliative measure.

The objection to the first of these methods is that in very thick plates the apical end of the root of the continuous-gum tooth might not reach the solid wall of vulcanite covering the ridge, but end in the porous portion, thus failing to prevent contraction. The writer lately made a cubic inch block of vulcanite which showed when sawed asunder that the solid shell averaged only $\frac{1}{12}$ inch in thickness at each wall, while the cavity left after scooping out the spongy center was nearly $\frac{7}{8}$ inch in diameter. If a long-rooted tooth piercing this porous mass failed to reach the farther wall it would act only on the immediate wall as regards preventing shrinkage, for the porous portion would not afford sufficient hold to the root to affect contraction of the side walls. However, this was an extreme case; few plates are so thick that they would not receive benefit from the long root of the continuous-gum tooth, especially if weighted rubber were used as a filler, this rubber being less porous, as well as less contractile, than other rubbers. It could undoubtedly be rendered more so by the maceration into it of filings of metal—tin for the lower jaw, aluminum for the upper.

But another serious objection to the use of continuous-gum teeth still remains—the difficulty to the dentist of obtaining them readily and in the sizes and shades desired, because of their not being

* See Cosmos for July 1903, p. 529.

carried by the average depot and traveling salesman, or only in small quantities. The second method is not subject to the above objections, and is very easily performed, but has the serious fault of not providing against vertical contraction for any other than the first vulcanization of the plate. The experiments with this method were made as follows:

EXPERIMENTS WITH THE PITTING METHOD.

Two vulcanite full upper plates were made, one having pits drilled in the model, the other not. The models used in making these plates were cast in a No. 2 impression tray, and with Spence's non-expansive plaster. Two more casts were also made in the same manner and material, one to go through the vulcanizer (unflashed), together with the two plates (to test for inter-vulcanizer expansion of the models), and the other to act as the test model, to be tried in the plates to determine the amount of their departure from the form of the model.

Wax was then built on the two models and teeth set in the wax, exactly as is done in making a full upper denture. The teeth were left freely exposed, to allow the plaster to grasp them firmly. On one side of each plate the wax was thickened until it, together with the teeth, measured $\frac{3}{4}$ inch, measuring from grinding surface to ridge. This afforded $\frac{3}{4}$ inch of vulcanite for the testing of vertical contraction.

After opening flasks and removing wax, there were made with a spade drill about thirty pits in one of these models, about $\frac{1}{16}$ inch wide and $\frac{1}{2}$ inch apart. These pits were made in horseshoe-shaped rows, one extending along the ridge and one each on the buccal and palatal slopes. To give retention to those on the ridge, they were drilled slantingly and about $\frac{1}{8}$ inch deep; those on the slopes did not need to slant nor be so deep, being of themselves at an angle to the line of contraction. (Where a ridge is quite sharp, all the pits should be on the slopes.) Tin foil was then placed on each model, and punctured at the pits, which showed their locations

plainly by depressions in the foil resembling smallpox marks.

When the flasks were opened after vulcanization, the results were found to be as expected. The test model was applied to the plates, and that one which had not been treated by the pitting method was found to have contracted on its thick side to an extent which could be seen at a glance and which admitted between test model and plate 24 folds of No. 20 tin foil, in a strip $\frac{1}{4}$ inch wide by 2 inches long. And that this contraction extended the whole length of the thick portion of the plate was demonstrated by the strip of foil reaching in at least up to the canine before becoming tight. The other plate, on the contrary, showed perfect adaptation at both ridges, not admitting a single thickness of tin. This made it evident that the spurs of vulcanite had properly performed their work by holding the plate to the model until cooling fixed its shape permanently.

Instead of any sinking of the ridge surface, there appeared, on the contrary, in this last-mentioned plate a slight sinking of the palate, as shown by a space between test model and vulcanite which admitted 4 folds of No. 20 tin foil at the posterior border of the palatal dome. This was caused, almost beyond doubt, by the vulcanite, in its effort to contract compressing to a small degree the investing plaster on the lingual surface of the palate. Had it been desirable to prevent this contraction, this could undoubtedly have been done by drilling a few pits slantingly in the palatal dome of the model. Or it could have been effected by making the investing plaster set harder, this being only a matter of long stirring with Spence's plaster, it being capable of taking a hardness eightfold greater than that of plaster of Paris. That which was used in these experiments was stirred only three minutes and became only three or four times harder than would plaster of Paris; but this was deemed sufficient, the writer believing that this is hard enough to prevent all appreciable change of form of the model from compression in flask-closing, when ordinary care is used, and also to

prevent any *undesirable* compression of either model or investment from the pressure of the vulcanite in its struggle to contract while cooling.

I say "*undesirable* compression," for a slight shrinkage of the palatal vulcanite and also of the breadth of the plate is desirable, because throwing the bearing more on the ridge and buccal surfaces and less on the palatal roof. A plate so made is more likely to sit firmly a few weeks after insertion than is one that fits exactly at first. That which is needed is not fit, but adaptation. A plate which exactly *fits* a mouth, and thus bears as much on the hard as on the soft places, will not be so firm and tight, even the first day, as one that bears a little more on the soft places—which we know are usually found on the ridge. Therefore it is good practice to shave an impression at its hard portions, deepen its rugæ (when these are hard), and build up its soft portions with layers of tin foil or by scraping the model. Moreover, there appears to be with some patients a slight absorption of the ridge following by a few weeks or months the insertion of a plate, as though the extra warmth afforded by it stimulated the osteoclasts to renewed action.

I cannot say what would result from using this pitting method in a plaster-of-Paris model, not having attempted to test the matter by experiment, but imagine that the spurs of vulcanite would need to be wider or more in number than those of my experiment to afford sufficient grasp on the much softer plaster; because plaster of Paris softens during vulcanization much more in proportion than does my plaster, coming out of the vulcanizer only one-sixth or one-eighth as firm. I was discouraged from experimenting with plaster of Paris by the consideration that the changes which take place in a model and investment of that material would render results doubtful, and that whatever the result in one case might be, this would afford no criterion for other cases, because said changes are not constant. That the models used in the above experiments did not change shape from the action of steam in vul-

canization was demonstrated by the third of the four casts, which went through the vulcanizer with the other two, and came out unchanged, exactly fitting the tray in which they were cast. A still more exacting test of this matter was made in the next experiment, soon to be described.

Unfortunately the first shrinkage of vulcanite does not exhaust its capacity for contraction, but (as was shown by the writer in some previously recorded experiments in vulcanite)* a three-inch bar of this substance will contract each time it is subjected to vulcanizing heat, up to four or six times, till, in lessening degrees, it has shrunk 3.0 mm. Therefore a plate which might be made correctly by the last related method, would perhaps be ruined at its first repairing. This would be all the more likely to occur with an unyielding investment, like Spence's plaster; for a soft plaster-of-Paris investment would permit a drawing down of the palatal arch of the plate and so tend to counteract the sinking at its ridge. To provide against this possible future contraction the third method was thought out, and was tested by experiment in the manner related in the following paragraphs.

THE STAPLE METHOD.

A vulcanite plate was made similar to the two others, differing only in the means used for preventing contraction, which was done by Ω -shaped serrated wires, resembling staples or carpet tacks, penetrating the vulcanite vertically; we will term them staples. After opening the flask and removing the wax the case was packed with warm rubber sufficiently full to bring the rubber in touch with the model, the flask being occasionally brought together to show when this took place. The upper surface of this rubber, bearing the impress of the ridge of model, indicated the height to which the upper portion of the staples might and should come, while their required length was easily found by thrusting into the rubber a pointed instrument until its

* *Items of Interest*, June 1903.

point struck the subjacent teeth. The staples were cut accordingly, being made from the $\frac{1}{2}$ -inch wide serrated platinoid bars sold at the depots "for strengthening rubber plates." These bars were found better when annealed, being otherwise liable to break. Four of the staples were used. Over them was placed one thickness of rubber, to prevent their actual contact with the model. As an aid to these staples, and also with a view to assisting the plaster in preventing areal contraction, pits were drilled in the *investing* plaster (not in the model); one row along the buccal and labial borders, another on the palatal slope near the teeth, and a third along the posterior palatal border; but I have my doubts as to their practical utility, especially those on the buccal and labial borders, for they could but feebly affect vertical contraction, and I imagine that the little of areal contraction that can take place when Spence's plaster is used is of benefit, because slightly contracting the plate; and the large contraction that occurs when plaster of Paris is used is still more desirable, being rarely enough to compensate for the expansions of the model. But the rows of pits running along the posterior border would not, unless quite deep, be likely to interfere with this desirable drawing down of the palatal dome, and would be of some value in preventing areal contraction directed from the posterior border toward the center of areal contraction, which is of course the center of the plate, about at the rugæ.

Result: After vulcanization the test model was placed in the plate, which was found perfect along both its ridges, not admitting one thickness of foil between plate and model. There was, as before, a space of about 5 folds of tin at the dome, but this was, as previously explained, desired and designed.

An attempt had been made to remove entire from this plate the model on which

it was molded and vulcanized, in order, by replacing it in the tray in which it had been cast, to determine if it had changed form during flask-closing and vulcanization. Unfortunately it broke in two in being removed; but this did not seriously invalidate it for the use intended, the fracture being sharp; so that when the two pieces were placed in the tray they virtually acted as one piece. Result: No change of shape was detectable, except in a small portion of one of the buccal surfaces where, owing to the rubber having been there largely in excess, a slight compression in flask-closing had occurred, admitting two thicknesses of the foil. This test is important, because showing beyond doubt that the vulcanite, not the plaster, is to be charged with the changes of form related in this record of these experiments.

If plaster of Paris be used for model and investment, areal contraction should be welcomed, but vertical prevented; because vertical contraction and the expansion of plaster-of-Paris models both conspire to throw pressure on the palate. While making these experiments the writer repeated an experiment made long ago—that of making a cast of plaster of Paris in an impression tray and then subjecting it to 320° F. in the vulcanizer for five minutes, with the result that its expansion increased from 8 to 20, as counted by folds of No. 20 tin foil placed between plaster and tray at the posterior border of the palatal dome. To compensate, therefore, for this large expansion, the free contraction of vulcanite permitted by a mushy plaster-of-Paris investment is desirable, but if the rubber over the ridge is to be at all thick—certainly if it be as much as $\frac{1}{4}$ inch—one or other of these methods should be employed to prevent vertical contraction; and the staple method has, I believe—especially where plaster of Paris is used—the greatest merit, especially where future vulcanizations may occur.

NOTES ON SYSTEMIC AND LOCAL THERAPEUTICS IN CERTAIN ORAL DISORDERS.

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DISEASES of the teeth and neighboring structures are treated by dentists mainly by local medication, and with almost entire disregard of the fact that in a considerable number of cases dental disorders, especially of the acute type, in which violent pain is always a concomitant factor, can be promptly relieved by the judicious combination of both local and systemic medication.

The question of the legal right of dentists to prescribe general therapeutic agents is one which naturally is awakened whenever allusion is made to the advisability of extending the scope of dental therapeutics to embrace not only local remedies but the general or systemic ones as well. In this connection it may be of interest to refer to the opinion of an experienced dental writer, who in a recent number of a dental publication states that "The dentist has the same right as the physician to administer systemically or apply locally any drug in the pharmacopeia, provided that it is employed in the strict line of his professional work." In the same article it is further mentioned that the dental law of Pennsylvania requires that the applicant shall pass a successful examination before the State Dental Examining Board both in materia medica and anesthesia, and that it is not to be assumed that the state requires a man to know what he is forbidden to practice.

The foregoing opinions are reinforced by the fact that the course on materia medica in dental schools, at least in the most progressive ones, is not restricted to the study of local agents, but includes the consideration of a group of systemic

agents for administration in the treatment of localized oral diseases or of general systemic disturbances which may be either the cause or the effect of oral pathologic manifestations.

Rehfuß (*Treatise on Dental Jurisprudence*), discussing the limitations of the practice of dentistry, states that "Dentists must prescribe medicines in certain cases," and that "A dentist certainly should be held responsible for neglect if he does not use internal treatment in cases that positively require it and where failure can be attributed to this negligence or want of skill."

WHAT THE D.D.S. DEGREE IMPLIES.

The D.D.S. degree implies, in our opinion, that the holder thereof possesses the knowledge and ability required to undertake and under favorable conditions to carry out the treatment of diseases of the teeth and their adnexa, the correction of irregularities of these organs and of the facial deformities resulting therefrom, the diagnosis of pathologic manifestations throughout the body consequent upon diseased conditions of the teeth and surrounding structures, and lastly, he should be able to recognize and diagnose such general disorders as may act as the predisposing or direct causes of oral diseases. That the field of action of the "dental surgeon" comprises the disturbances embraced under the foregoing headings is the conclusion which we are forced to adopt in view of the present status of dentistry, and furthermore because of the liberal interpretation given to the term by the learned and acknowledged authorities on dental and dento-legal matters.

The logical conclusion to be drawn from the above statement is that the dentist must perforce be familiar with a reasonable number of drugs and their mode of employment in the treatment of the disturbances already enumerated, if he is to practice dentistry according to the status of advancement in which we find it today. As an instance of the good that may be done by the administration of systemic remedies in the treatment of some dental disorders we will now consider from a general therapeutic aspect some of the most common morbid conditions that may come under the supervision of the dentist.

TREATMENT OF SOME DENTAL DISORDERS.

ODONTALGIA.—Some acute cases of odontalgia, consequent upon pulp-exposure and subsequent irritation or as the result of pericemental inflammation, do not at times respond promptly to the application of local sedatives or anodynes by reason of the severity of the attack and the hypersensitive state of the patient's nervous system. In such cases, after the prescribed local treatment has been carried out, the patient should be directed to take twenty to forty grains of sodium bromid in hourly doses of ten grains. The rationale of this treatment is based upon the fact that the bromids, besides lessening the activity of the brain-cells, produce somnolence and a marked decrease in the sensitivity of the peripheral nerves. Furthermore, the use of the bromids in this connection is valuable in subduing the marked nervous irritability the result of continuous pain.

ACUTE ALVEOLAR ABSCESS.—In the incipient stage much good can be done by judicious systemic medication. After thoroughly cleaning out the root-canal or canals of the infected tooth, the administration of quinin sulfate in doses of three to five grains, conjointly with hot pediluvia,* will mitigate the severity of

some cases and in exceptional occasions will abort the attack. The writer recalls two cases in which the aforesaid treatment produced most satisfactory results. The main purpose of drug administration is to help the organism to carry out its own protective functions; therefore the use of quinin in alveolar abscess is necessary if not imperative in view of its action upon low forms of organized life and of its property of increasing the number of white blood corpuscles, thereby assuring active phagocytosis.

In the advanced stages of dento-alveolar abscess the systemic disturbances are of such a severe nature that their disregard by the attending dental surgeon may result in serious and painful inconveniences to the patient. The extreme tenderness of the tooth, and the degree of inflammation in the apical region and adjacent soft tissue areas, is so severe that to give immediate vent to the incarcerated pus becomes a difficult and perhaps for the time being an impossible procedure. The agonizing pain always present in this type of cases precludes all mechanical interference until the inflammation and accompanying pain have slightly subsided, and, as this is not possible until the pus finds an outlet through the alveolar plate, something must be done in order to subdue the torturing pain. A careful survey of the general disturbances that must necessarily follow the formation of pus within hard and unyielding walls should be the basis upon which to build the plan of therapeutic interference. The general symptoms of pus formation in the case of dento-alveolar abscess are pain, fever, nervous irritability, and sleeplessness, which can be combated by the administration of the following preparation:

moderately warm water, the temperature of which is to be gradually raised by the addition of water of higher temperature until rendered unbearable. The feet should then be wrapped in a separate blanket and the patient should thereon retire. This technique is the reverse of the old method, in which the feet are immersed in hot water gradually allowed to cool down, thereby weakening or nullifying the stimulating effect of the high temperature upon the peripheral vessels.

* In this connection it may be of interest to call attention to the fact that if foot baths do not generally produce the desired results it is because they are not taken in a rational way. The feet should be immersed first in

R—Quininæ sulphatis, gr. xxx;
 Acetanilid, gr. xxiv;
 Caffeinæ citratis, gr. iiij.
 M. et fiat pil. no. xij.
 Sig.—One every hour.

It may be advisable to precede the administration of the quinin-acetanilid mixture by a saline cathartic in the shape of magnesium sulfate $\mathfrak{z}\text{iv}$, or the liquor magnesiæ citratis $\mathfrak{z}\text{ij}$ to $\mathfrak{z}\text{v}$. This line of treatment is particularly indicated in cases in which surgical treatment is contra-indicated because of the severe pain in the face on the side of the affected tooth. In such cases local anesthesia cannot be resorted to because of the inflammation present, and a general anesthetic requires that the patient be previously prepared—which of course demands considerable time, thereby prolonging the already intense suffering.

In neglected cases where the course of the disease has been permitted to progress to the point when, after infiltrating the cellular tissues, pus is about to break through the face at the point of least resistance, something should be done to prevent the occurrence of this phenomenon, which is followed by the formation of the unsightly scars that are so often seen, especially among people unmindful of the results that may follow the neglect of dental disorders. The treatment consists in directing the patient to hold in the mouth hot fluids, such as water or milk, and in the external application of the following astringent and antiphlogistic lotion:

R—Plumbi subacetatis, gr. xxx;
 Tincturæ opii, $\mathfrak{z}\text{ij}$;
 Aquæ, $\mathfrak{z}\text{viij}$. M.

Sig.—To be applied upon the area of inflammation.

Of course dento-surgical treatment should be undertaken at once, as the treatment here indicated, while of material help in preventing the formation of an external fistula, will be of no avail if the *causa morbilifera* be not removed.

PYORRHEA ALVEOLARIS.—In no other affection which the dentist is called upon to treat is systemic medication of greater utility than in the treatment of those pericemental and alveolar disorders con-

jointly known under the much-abused term "pyorrhea alveolaris." Every practitioner is of course aware of the rôle played by salivary and serumal deposits in the pathogeny of these disorders, and will consequently appreciate the importance of proper therapeutic intervention in order to prevent, so far as it may be possible, the recurrence of the local predisposing cause, *i.e.* the serumal deposits which are but a manifestation of a hyperacid diathesis characterized by incomplete oxidation. That variety of pyorrhea alveolaris in which the cause can be attributed to infection subsequent to irritation at the cervical margin by salivary (phosphatic) deposits is mainly a local disorder, and here internal medication would be of little avail. In the treatment of disorders of the hyperacid diathesis small doses of phosphorus (gr. 1/100), or of arsenic iodid in conjunction with the glycerophosphates of lime and soda have been recommended, and this treatment in connection with correctly adjusted exercise and diet has given most satisfactory results.*

The elimination of the products resulting from insufficient oxidation as exhibited in the gouty diathesis, of which pyorrhea alveolaris may be a manifestation, is greatly facilitated by the administration of saline purgatives, water in large quantities, and lithium bitartrate.

POST-EXTRACTION HEMORRHAGE.—When this takes place in comparatively normal individuals it is promptly arrested by such well-known agents as tannin, alum, the iron salts, in conjunction with packings of gauze, cotton, modeling composition, plaster, and in some cases the extracted tooth itself—as nothing could fit the alveolus more accurately. But where the dentist—and for that matter, the physician—may exhaust all the means and devices at his command, is in those dangerous cases of hemorrhage following tooth-extraction in the hemophilic. In such cases the following preparation may prove valuable:

* "The Saliva as an Index of Faulty Metabolism." By Edward C. Kirk, D.D.S., Sc.D.

R—Vin. ergotæ, U. S. ℥ij.

Sig.—One teaspoonful every two hours.

In cases of persistent hemorrhage the internal use of morphin has been recommended, as by slowing the heart's action it is apt to lessen the hemorrhage.

Gallic acid may also be used in this connection in doses of gr. v, and adrenalin chlorid locally may help toward arresting the flow of blood. The internal administration of calcium chlorid has been recently introduced in the therapeutics of hemophilia by reason of its supposed property of increasing the coagulability of the blood, and Wallis (*Journal of the British Dental Association*, August 1902) reports two cases thus treated successfully, while Morley (*Transactions Odontological Society of Great Britain*, May 1903) reports one case treated by large doses of calcium chlorid internally and adrenalin locally.

Viau* recommends as a local application the following styptic colloidon:

R—Collodii,	℥ij;	
Acidi carbolici,	℥ij;	
Acidi tannici,	℥j;	
Acidi benzoici,	℥j.	M.

Sig.—Apply within alveolus.

POST-EXTRACTION PAIN.—As this subject has already been discussed by the author in a previous communication,† reference to it will be omitted in this paper.

FACIAL NEURALGIA.—In facial neuralgia when of malarial origin the use of quinin in large doses is indicated, but where the malarial factor has been eliminated it should be substituted by tincture of aconite in doses of one to two drops four times daily. Of course this treatment is only applicable in cases of trigeminal neuralgia of obscure origin, especially when pain persists notwithstanding that all the teeth are perfectly sound and no plausible cause can be detected. In the treatment of facial neuralgia temporary relief may be attained by the administration of either of the coal-tar products, pending the removal

of the apparent cause. In tic douloureux, Dana (*Boston Medical and Surgical Journal*) recommends daily injections of strychnin gradually increased from gr. 1/30 to gr. 1/5 (ten to twenty days are required to reach this maximum). Krauss (*Buffalo Medical Journal*) reports on cases which improved by the administration of nitroglycerin in tablets of gr. 1/100 until the production of the full physiological effect.*

ACTINOMYCOSIS HOMINIS.—The pathological manifestations consequent upon infection with the ray fungus are of such a nature as to be properly within the province of either the general or the oral surgeon, but, considering that cases may come under the supervision of the general dental practitioner, a few indications as to preliminary treatment may perhaps be found useful. The fistulous tracts should be treated, with a view to their obliteration, by strong antiseptics or coagulants. Tincture of iodine locally has been used successfully conjointly with potassium iodid internally. The following combination may be used:

R—Potassium iodidi,	℥j;	
Syrupus simpl.,	℥ss;	
Aquæ destill.,	℥ij.	M.

Sig.—Two teaspoonfuls in water four times a day. —E.

Sodium salicylate has produced amelioration of symptoms, but potassium iodid has a better record than any other agent. "This drug has cured six human cases in Holland." (Netter.)†

NOMA.—The treatment of noma (gangrenous stomatitis), one of the most destructive of the diseases of childhood, results often in failure because of the intricate and obscure nature of its pathogeny. The disease is comparatively rare and more particularly affects children whose status of health is considerably reduced through unhygienic surroundings; thus it develops almost exclusively in children of the lower classes. To arrest the gangrenous course of this malady

* "Formulaire Pratique pour les Maladies de la Bouche et des Dents." Paris, 1893.

DENTAL COSMOS, January 1904, page 77.

* *Sajous' Annual and Analytical Cyclopeda of Practical Medicine.*

† *Potter's Materia Medica, Pharmacy, and Therapeutics.*

prompt and radical measures should be taken. The affected area should be treated with pure carbolic acid, or with strong solutions of zinc chlorid, silver nitrate, trichloroacetic acid, or chromic acid; and even better yet, with the actual cautery. It is of the utmost importance that local treatment should be undertaken at once, and that it should be associated with proper internal medication, consisting of saline cathartics and the following tonic combination:

R—Strychninæ sulphatis, gr. $\frac{1}{2}$;
 Quininæ bisulphatis, gr. xxx;
 Ferri carbonatis, gr. lx.
 M. et fiat pil. no. xxx.

Sig.—One every four hours. —E.

The doses of the ingredients in this formula are intended for an adult; for children they must be reduced according to Young's rule.*

APHTHOUS STOMATITIS.—This variety of inflammation of the mouth frequently encountered in children must be treated by first directing attention to the condition of the child's digestive function. The infection of the oral mucous membrane is nearly always preceded by a marked decrease in vital resistance the result of some general indisposition. It is frequently associated with general debility the result of impaired digestion, and to this phase of the disease as much attention should be paid as to the local treatment, which should consist of antiseptic washings. For this purpose the following prescription may be employed:

R—Sodii boratis, gr. xx;
 Saccharinæ, gr. v;
 Glycerinæ, f5j. M.
 Sig.—Use locally and in full strength.

Or,

R—Sodii biberatis, gr. xxx;
 Thymolis, gr. iij;
 Aquæ destillatæ, 5viij. M.
 Sig.—Use as a mouth-wash. —E.

* To the age of the child add 2 and divide by 2 and the result will be the denominator of a fraction the numerator of which is 1. Thus if we consider that 4 grains is an average dose of quinin for an adult, for a child

of four it will be $\frac{4+2}{2} = 3$, or $\frac{1}{3}$ of 4 grains.

Silver nitrate in the proportion of gr. lx to the ounce of water applied locally upon the aphthous spots will help to reduce the inflammation.

FETOR OF THE BREATH.—After a series of close observations, Dr. Rosenheim (*Die Therapie den Gegenwart*)* has concluded that when feter of the breath is not the result of some disturbance of the mouth or teeth or throat, it is nearly always due to some disturbance of one of the more deeply lying organs of nutrition, generally the intestines, and that this is the case in spite of the fact that in many such instances there is no complaint which points to the fact of the function of these organs being in any way disturbed. He recommends that the esophagus be carefully examined, as it may be the source of the trouble; for cancer, or any other condition of this organ which leads to retention of food, may give rise to an unpleasant breath. In many cases the stomach is the organ which is at once blamed, but the author finds that this viscus is often free from reproach. He has found that in the large majority of cases it is the intestines that are at fault. In treating these cases it is most important to remove constipation and to secure regular and free evacuation of the bowels. It is further recommended that the amount of nitrogenous food should be strictly limited, and in many cases it is better to restrict the patient to diet from which meat is entirely excluded.

Feter of the breath is a symptom of decomposition within the alimentary canal. With the intention of counteracting this decomposition, Dr. Rosenheim recommends the administration of menthol in doses of from 0.1 to 0.15 gm. (about $1\frac{1}{2}$ to $2\frac{1}{2}$ grains). The writer has used for the same purpose, and with gratifying results, salol in doses of 5 grains every two hours.

When due to the presence of carious teeth or to some purulent condition of the gingival or buccal mucous membrane, attention should be directed to the local disorder and an appropriate mouth-wash

* *Treatment*, vol. vi, No. 11.

should be prescribed. The following formula, recommended by Professor Truman, has given the writer entire satisfaction:

R—Hydronaphthol, gr. xv;
 Alcohol, ʒj;
 Aquæ destillatæ, ʒj. M.

Sig.—One teaspoonful in a tumbler of water. —T.

As a milder preparation the following may be used:

R—Acidi borici, ʒj;
 Sodii biboratis, gr. xx;
 Aquæ rosæ, ʒiv. M.
 Sig.—Use in full strength. —E.

Solutions of potassium permanganate 1:2000 or carbolic acid 1:200 may be substituted for the two previous formulæ.

There are many other disorders which would come strictly within the scope of this paper, but, as its purpose is merely to point out the important rôle which general medication may be made to play in the practice of dentistry, further reference to the therapeutic aspect seems unnecessary, especially in view of the fact that the disorders herein treated—excepting actinomycosis and noma—are amongst the most frequent ones encountered in the course of dental practice.

ON THE ORIGIN OF POTASSIUM SULFOCYANID IN THE SALIVA.

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THE beautiful claret-red reaction which in most human salivas follows the addition of acidulated ferric chlorid has been the subject of much study. Tiedemann and Gmelin established the fact that the substance causing the reaction was potassium sulfoeyanid.

It is peculiar that practically all of this compound formed in the body is eliminated by the salivary glands, particularly the parotid,¹ though the statement has been made that it was also found in the lacrymal and nasal secretions.² The question at once arises as to whether KCNS is formed in these tissues, or whether it originates in some other part of the body and by a selective action of the cells of the salivary glands is eliminated by them.

To answer this question a series of three experiments was made upon dogs. KCNS in doses of 0.033 gram to each kilo of body weight was injected into the jugular vein at fifteen-minute intervals. Three such doses produced death of the animal. Equal amounts of the

kidneys, liver, and salivary glands were removed from the body and the quantity of KCNS contained in the specimens was ascertained. In every instance the greatest amount was found in the kidneys, less in the liver, and only a trace in the salivary glands; and therefore, as normally more KCNS is found in the saliva than in any other secretion or excretion of the body, it can be assumed that this substance had its origin in the salivary glands. In other words, the result of the experiment seems to negative the presence of any selective action on the part of the salivary glands.

That KCNS is formed in the saliva before reaching the mouth has been demonstrated by Schneider, who inserted cannulas into Wharton's ducts and found KCNS present in the secretions.

CHEMICAL ORIGIN OF KCNS.

As to the chemical origin of KCNS, it is believed by all experimenters to be formed by the breaking-down of proteids, three sulfur waste products being formed—etherial, preformed, and neutral—the

latter containing the least oxygen, and therefore in this group KCNS has been included. These neutral sulfurs are eliminated in increased amounts in conditions where there is a lack of oxygen in the system, as in asphyxia;³ this fact was the incentive for a series of experiments wherein proteids were broken down outside of the body in the absence of oxygen, as in vacuum, or in the presence of deoxidizants, but in no instance was KCNS formed unless additional means were used, bringing about conditions that would not occur in the body.

Now, why is it that although proteid is acted upon by every tissue in the body, yet only the salivary glands are capable of forming KCNS? This question suggested the possibility that there was in the salivary glands an unorganized ferment which would break down proteids into KCNS. This possibility is made more plausible by the fact that a ferment forms sulfoeyanid of allyl in mustard. Various extracts of the glands were made and brought in contact with proteid at body temperature without producing this substance, the time of the experiments varying from two hours to five weeks; some being conducted in the presence of free oxygen and others in its absence; the media being acid, alkaline, and neutral in reaction.

It is not known from which of the intermediary substances of proteid decomposition KCNS is derived, but Fenwick⁴ pointed out the close chemical relationship between this salt of potash and bile salts, as far at least as the percentage of sulfur contained. He further demonstrated that the quantity of KCNS depended upon the amount of bile salts in the blood; a marked increase being noticed in jaundice. Neumeister⁵ claimed that all neutral sulfurs were decreased when biliary fistula was established. It might be mentioned that experiments wherein bile salts were treated as were the proteids yielded negative results.

CLINICAL SIGNIFICANCE.

As to its clinical significance, Fenwick found KCNS increased in liver dis-

turbances attended with an increase in the quantity of bile salts circulating in the blood. It is supposed to be increased in convalescence from many acute diseases. In gout, rheumatism, cachexias and conditions producing pyorrhea alveolaris it is claimed to be present in greater amounts; but in all recorded instances close scrutiny of the methods and conditions makes this as a means of diagnosis of doubtful value. To ascertain with certainty that KCNS is eliminated in increased amounts saliva should be collected for the total twenty-four hours—which would be impossible. Again, the quantity of KCNS in the saliva varies in different specimens obtained from the same individual, being dependent upon activity of the glands, as tests made during activity recorded 0.0035 per cent. or less—a weak reaction; whereas tests made during the period of rest recorded 0.0087 per cent. or more—a strong reaction. This is nature's precaution, for if the large amounts found in the saliva from glands at rest should continue throughout salivary digestion, symptoms of KCNS poisoning might follow. This concentration in the saliva during rest of the glands should be considered when studying its value in acute diseases. In six cases of typhoid fever where KCNS tests were made throughout the course of the disease, less amounts were found in convalescence, due probably to increased secretion of saliva.

The most practical reagent for detecting the presence of KCNS is an acid ferric chlorid solution; this gives a red reaction which clears upon the addition of mercuric chlorid; however, if lactic acid be present, as it frequently is in many diseased conditions of the mouth, this color reaction is not so intense, leading to the estimation of smaller quantities than are actually present. If acetic fermentation be active, it tends to apparently increase its reaction. A more accurate test is to treat the saliva with iodic acid and starch solution; the KCNS will break down the iodic acid and liberate iodine, which combines with the starch and gives a blue reaction.

The disadvantages of this test are that iodic acid is an unstable compound, and that lactic acid will interfere with the test.

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"HERMOPHENYL"—ITS APPLICATION IN STOMATOLOGY AND ODONTOLOGY.

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(Abstract of a paper read at the Section on Stomatology and Odontology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

I HAVE the honor of submitting for your consideration the special properties of a new medicament, "hermophenyl," which has already rendered valuable service in general therapeutics and which I believe should also give extremely useful results in dental surgery.

"Hermophenyl"—a mercury-phenol-disulfonate of sodium—is a white powder, extremely fine and amorphous; it is very soluble in water, and contains forty per cent. of mercury.

According to Dr. Bérard, hermophenyl possesses bactericidal properties to a great degree. A ten per cent. solution of hermophenyl destroys in ten minutes the principal pathogenic bacteria (*bacillus coli*, *Eberth bacillus*, the *staphylococci*, *bacillus subtilis*, and *bacillus pyocyaneus*). Solutions of 1:1000 are equally destructive to the micro-organisms named, but require a greater length of time to accomplish this result.

This drug is free from irritating properties, and even in the solution of 40:1000 can be brought in contact with the skin and mucous membrane for several minutes without producing any irritability whatever. Even in solutions of 1:500 and 1:100, and after prolonged

contact, it does not apparently produce any inconvenience. Lastly, hermophenyl when taken internally does not produce the symptoms that usually follow the ingestion of salts of mercury; it never causes *gingivitis* or *stomatitis*. (Dr. Auguste Mournand.)

Of all the antiseptics employed in stomatology the mercury salts are certainly to be preferred. Potassium permanganate is contra-indicated because of its excessive coloring properties; hydrogen dioxide has its disadvantages, and boric acid is too weak and is being gradually abandoned.

Antisepsis of the mouth is both necessary and indispensable, and while strict measures to this effect would perhaps be considered superfluous in the case of individuals in a state of health, you will admit that oral cleanliness as generally practiced is insufficient in the case of epidemics, suspicious lesions, and even slight inflammations. We must not lose sight of the fact that the mouth is a "microbic receptacle"—holding microbes from the air, Koch bacilli, pneumococci, staphylococci, sarcinae, and the special micro-organisms of the mouth—*leptothrix buccalis*, *spirochetæ dentium*, *bacterium termo*, and all those salivary mi-

crococci and bacteria which produce septicemia when injected in the rabbit, as shown by Pasteur's experiments.

It is not only by the external avenue that the mouth becomes the receptacle of bacteria. During the course of various infections the salivary glands serve as avenues of elimination, and the microbes from the blood current which collect there find an exit into the mouth. A variety of stomatitis is thus produced. Therefore, and by reason of the possible or actual infection of the buccal medium, we should endeavor to devise means to diminish, if not to completely destroy, the infective agents.

I believe that our daily hygiene should be directed toward bringing about antiseptics of the mouth, and should be practiced after meals. It is not merely washing out the mouth that I mean, but we should prevent by destruction or exclusion the development and propagation of pathogenic bacteria. In case of epidemics or of buccal inflammation this method becomes *a fortiori* a necessary prophylactic measure.

I believe that hermophenyl will produce the necessary results for the reasons which will be now enumerated:

(1) It is a mercurial compound which, in contrast to all other such compounds employed, does not precipitate albumin. This was publicly announced at the Academy of Medicine by Professor Hallopeau. It is a property which is of great importance, inasmuch as the objection raised to the use of the other compounds of mercury for antiseptic purposes is that the great affinity of mercury for albumin decreases the antiseptic power of the solution; and further, the formation of a layer of albuminate of mercury upon the tissues prevents to a certain extent the penetration of the antiseptic.

(2) Hermophenyl is not precipitated by sodium, by hydrochloric acid, or by ammonium sulfid; nor is it decomposed by heat at 120° C.

(3) Hermophenyl does not amalgamate; a leaf of gold when left for forty-eight hours in contact with a 1:20 solution of hermophenyl remained intact.

This is a point worthy of consideration, inasmuch as it may be used without fear of harming gold fillings or gold appliances.

(4) Hermophenyl is a powerful antiseptic and an excellent antiphlogistic, especially in cases of buccal inflammation. It is not irritating. Its taste is not objectionable, especially when associated with the essential oils usually employed in dentistry.

I have carried on a series of experiments with this drug, and as a result I feel certain that the buccal region, the saliva, and the mucous secretions show a considerable decrease in microbes after irrigations with hermophenyl, and that this salt of mercury attacks particularly the pathogenic varieties of microbes. I have observed its action in inflammations, whose progress has often been moderated or completely arrested by its means. Incidentally, I wish to state that according to Ost the antiphlogistic action of mercury can be explained by the fact that it brings about a diminution in the proportion of fibrin, a substance which is found in excess in inflammatory diseases, of which gingivitis and stomatitis constitute a very definite type.

A marked advantage possessed by hermophenyl consists in the fact that it can be applied locally in strong solutions without causing the patient pain or irritation.

This agent is one of great importance in certain forms of torpid gingivitis and of buccal ulcerations. In such cases it would be better to employ hermophenyl in strong solutions than certain caustics, such as tincture of iodine, chromic acid, etc.

The taste of hermophenyl while decidedly metallic, is, however, supportable—at least, it is very much less objectionable than that of corrosive sublimate, which even when disguised and in weak solutions leaves a disagreeable styptic taste.

To recapitulate, I will state that in all cases of stomatitis, gingivitis, or perioritis, whenever pus may be present in the mouth, one can use successfully and

without danger irrigations of hermo-phenyl. Frequent gargling should be prescribed, to prevent, so far as it may be possible, the spread of the inflammation and the complications that may follow.

The strength of hermophenyl solution

for daily use should be of from gr. $\frac{1}{3}$ to gr. $\frac{2}{3}$ to a half-glass of water. For therapeutic irrigations the proportion should be from gr. $\frac{2}{3}$ to gr. 2 to water \mathfrak{z} viii. For topical applications upon ulcerated surfaces the proportion should be increased from gr. $\frac{1}{3}$ to gr. 2 to water \mathfrak{z} j.

SYPHILITIC LESIONS OF THE MOUTH.

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(Read before the Northeastern Dental Association at Boston, October 21, 1903.)

PATHOLOGICAL changes about the tissues of the mouth of an infectious nature are constantly appearing, and the dangers of contracting disease ourselves, or of transferring it from the mouth of one patient to that of another makes this subject a timely one, when we consider the deplorable conditions that follow infections of this kind. The grave consequences from the accidental transmission of syphilis through neglect, ignorance, or carelessness on our part must strike us very forcibly when we see the amount of pain, suffering, and destruction of tissue, and even of life itself, which this disease causes. It is well in all cases to regard with suspicion any lesion or indolent ulcer of the mouth, and syphilis as an element should always be uppermost in our minds, not only because of its pathological importance, but also on account of the ruin it may bring to us or our innocent patients through our ignorance in determining the character, or through our carelessness in the use of instruments in the local treatment, of infectious lesions of the mouth.

A thorough knowledge of all infectious diseases of the mouth is essential to the dentist, that we may not only guard against infection ourselves, but also be in a position to protect others.

It is evident to you all that such a knowledge is needed in those diseases where an early observance and an accurate diagnosis are absolutely necessary, and where a clean, hygienic condition of the mouth is demanded. The ability to determine the character of any oral lesion is of the greatest practical value, that we may not only protect our other patients but be of valuable service to the patient afflicted. Our position in this matter is very clearly seen where we meet with a cancerous growth within the field of dental surgery. The importance of the condition cannot be overestimated, for it demands a prompt and radical operation, and an early recognition and diagnosis of the disease in its incipency are factors necessary for prolonging life, if not able to bring about a cure. So also, when we find the initial lesion of syphilis, the chancre, present, we can do much to prevent the spread of the disease by recognizing it early and by giving competent instructions to the patient.

Care of the mouth of syphilitic subjects concerns us, for with intelligent therapeutics, hygiene, and prophylaxis, a return to normal condition is greatly hastened, and with ability to recognize syphilitic and other infections of the mouth, and with care in the use of in-

struments, we protect our patients from infection, which, if nothing more, must be a source of satisfaction to us all.

SYMPTOMATOLOGY OF SYPHILIS.

Syphilis is found in two marked forms, acquired and hereditary, and although they differ somewhat in the order, time, and appearance of their symptoms, still they resemble each other in many ways. Ricord divided the course of the disease into three stages, primary, secondary, and tertiary, and this classification is used at the present day. The first stage includes those symptoms and pathological expressions that appear from the time of infection up to the advent of the so-called secondary symptoms. The secondary stage begins seventy to eighty days after infection, and under it is classed the lesions of the skin and mucous membrane with the constitutional disturbances. There is no definite lapse of time between the second and third stages. Tertiary lesions may appear with those of the latter part of the secondary lesions, or more often manifest themselves some time later. Necrosis of bone and the deeper structures characterize this last stage of the disease, but this is less seen now than formerly, due to improved therapeutics and hygienic measures.

Syphilitic lesions commonly met with in the field of dental operations, and which we will consider, are those of the lips, cheek, mouth, tongue, gum, tonsil, hard and soft palate, and the mucous membrane of the oral cavity.

The only lesion of the first stage, the chancre, appears at the point of infection after a period of incubation of from eighteen to twenty-five days, and it is essential that we recognize this lesion early, for its scanty secretion is very virulent and contagious. Generally it is but a single lesion; it is, however, found occasionally in the multiple form, but this type of chancre is rarely, if ever, found within our field. The chancreous erosion which is the most typical form of the chancre begins as a small, rounded, well-marked excoriated spot with an indurated base and the edges

slightly raised with the center slightly depressed. The surface is smooth, polished, and free from granulations, and it discharges a scanty serous fluid which is highly contagious. Its color varies from a light to a brownish red, or it may turn to a coppery color and its surface become covered with a crust. Chancres seated elsewhere than upon the genital organs are known as extra-genital chancres, and as far as concerns us the lip is the most frequent seat of them, then the tongue, tonsil, gum, and palate in the order named. The following statistics collected by Bulkley may be of interest. In 9058 cases of extra-genital chancre, 1810 were on the lips, 734 were found in the buccal cavity, and 401 appeared upon the tongue, tonsils, or gum; or, in other words, 32 per cent. of them appeared within the dental field. There is often a marked variation in the size of chancres. We find them small and superficial; then again, deep, extensive, and destructive-looking. At the same time or shortly after the appearance of the chancre the characteristic hardening and enlargement of the ganglia in direct relation to the seat of infection appears. If the chancre be upon the lips, the submaxillary and ante-auricular ganglia become involved; if it be upon the tongue the subhyoidan ganglia are affected. This affection of the ganglia may be only unilateral, but usually it is bilateral with the enlargement more pronounced on the side corresponding to the seat of infection. The ganglia are dense, movable, and feel hard under the skin like a pea, and pain is usually absent.

Chancres are found on the upper and lower lip, more commonly the latter, and are a common source of infection to relatives and friends. They often begin as a crack or fissure and are thought by the patient to be merely a cold sore. Herpes is contrasted with the chancre, however, in that there is a characteristic burning and itching. Then, again, the satellite glands will aid us in diagnosis. We should also differentiate between chancre of the lip and epidermoid cancer, commonly called epithelioma of the lip; age and an early involvement of the

ganglia are points to be considered in such a diagnosis. Chancres of the lip usually increase in size very rapidly and show no tendency to heal, and a noteworthy fact is that the lip is the most frequent seat of all extra-genital chancres.

Chancre of the tongue appears as a nodule or fissure, and is accompanied with well-marked induration. It causes much uneasiness to the patient, who fears it is a cancerous growth. In these cases, too, the age, with the induration, and the early involvement of the ganglia are reliable points in diagnosis. The seat of the lesion should also be considered, for cancer appears generally on the side of this organ, while chancre is more often found upon the dorsum of the tongue. This organ has the third place in frequency as the seat of extra-genital chancres.

In regard to the danger of infecting ourselves, an interesting fact is that 35 per cent. of all chancres of the finger have been found among dentists, and if more care were taken with cuts and abrasions and in the use of instruments it is readily seen that this figure would be lessened. Chancres begin on the side of the finger near the nail, have a tendency to marked development, and cause an immense amount of pain. The characteristic induration of the chancre is not well marked, but we find that the epitrochlear and axillary ganglia become involved.

LESIONS OF THE ORAL MUCOUS MEMBRANE.

Lesions of the mucous membrane of the mouth are very characteristic of the second stage of syphilis, and the most common erythema, according to Taylor, is that of the fauces and roof of the mouth, which may be a simple redness without any thickening, or redness with edema of the parts. A more advanced type of this condition is that in which the mucous membrane appears as though it had been touched with a weak solution of carbolic acid. This does not appear as one continuous, unbroken patch, but scattered all over the surface are patches

of varying shapes. Taylor says, "This condition may involve the soft palate and roof of the mouth on either one or both sides, and is decidedly diagnostic of syphilis, for in no other disease do we find this peculiar condition of milky-looking, superficially eroded patches."

Mucous patches, the secretion of which is exceedingly virulent, are flat or slightly elevated patches varying from a grayish pink to a reddish brown color, about half an inch to an inch in diameter. They begin as small red spots, oval or round in outline, and discharge a sticky, foul secretion. They heal very slowly on account of irritation, and flourish very well in an unclean mouth where tartar and decaying teeth are present, and they are commonly found on the mucous membrane of the cheek, particularly at a seat on a level with the line of occlusion. They also appear at the angle and roof of the mouth, on the tonsils, fauces, and sides of the tongue. While the saliva itself is not infectious, it is made so by flowing over these patches and coming in contact with their secretion.

Diphtheritic patches closely resemble mucous patches, and it is often very difficult to differentiate between the two. In syphilis, however, we do not have that marked depression that accompanies diphtheria. Then, too, the location of the lesion aids us in making a correct diagnosis.

These mucous patches often increase by enormous cell development to quite a size, and then the name condylomata is given them. This form of lesion, large, with sharp, steep, well-defined borders, has a tendency to coalesce; it is of a rosy red or grayish color, and like mucous patches discharges a foul-smelling secretion. To combat successfully these forms of syphilitic lesions a clean condition of the mouth is necessary, for they are aggravated chiefly by the presence of carious teeth and tartar.

Owing to improved ideas and methods in the treatment of syphilitic affections, lesions of the tertiary stage are not as commonly met with now as formerly, and although the lesions of this stage

are thought by some writers not to be contagious, still it is well to believe that they are. A very characteristic manifestation is necrosis of bone, commonly that of the hard palate, which is very insidious in its beginning and usually appears in front of the posterior nares and in the median line. Syphilitic gumma, especially of the tongue, is also characteristic of tertiary syphilis, though it is very rarely met with. It almost invariably begins on the central portion of that organ, while cancerous and tubercular ulcers have their seat on the side. The resemblance of cancer of the tongue and tertiary syphilis is striking, and it is all but impossible to distinguish between them without the aid of anti-syphilitic remedies. Secondary syphilitic affections need never be mistaken for cancer, and in chancre of the tongue early glandular involvement and the appearance of secondary symptoms make a diagnosis certain.

MERCURIAL STOMATITIS.

Mercurial stomatitis, salivation, or ptyalism as it is called, is a condition less frequently met with now than formerly, owing to the care used in administering mercury. It appears very suddenly when it does present itself, and is characterized by a metallic, stale odor of the breath, coated tongue, and bitter coppery taste which is more intense and disagreeable upon awakening. The gums are puffy and bleed upon the slightest touch. There is also a characteristic blue line along the gingival margin of the gum. Other symptoms are a profuse flow of saliva, diarrhea, headache, and no appetite. At last, if untreated, the tongue may swell to be too large for the mouth; the teeth loosen and fall out, the lips and cheeks become tumid, and ulcers appear in the mouth.

In the treatment, mercury should be stopped and an astringent mouth-wash should be prescribed. As an antisyphilitic 5 minims of a solution of atropin sulfate one grain to an ounce of water, hypodermically, every four or six hours, has proved very satisfactory. A good mouth-wash in salivation is com-

posed of tannic acid 8 grains, sodium bicarbonate and glycerin, of each 2 drams, and rose-water to make 8 ounces.

HEREDITARY SYPHILIS.

Hereditary syphilis resembles the acquired form in many ways, although the inherited disease has no chancre, nor is the appearance and evolution of its lesions as typical and regular as those of the acquired form. The most important symptom in making a diagnosis is snuffles, which is due to a thickening of the nasal mucous membrane in the newborn. The child becomes emaciated, the skin is wrinkled and apparently too large for the skeleton. The patient has a senile look resembling very much a little old man. Fissures appear on the mucous membrane of the lips and at the angle of the mouth. Mucous patches and condylomata appear at the junction of the skin and mucous membrane, and on other parts subject to irritation. They are round, oval, or irregular in outline, grayish or dark red in color, and the scanty viscid flow from them is highly contagious.

While many writers believe that certain malformations of the teeth have little or nothing to do with hereditary syphilis, still Hutchinson, who first described them, says, "If the patient is of age to show, they are most important marks of hereditary syphilis." He claims that there is nothing pathognomonic in the deciduous teeth, although they often present some peculiarities in syphilitic children. In the permanent set, the superior central incisors are the most typical, and are to be considered above all the others in making a diagnosis. They are usually of a dark color, narrow, peg-shaped, broader at the cervical border than upon the cutting edge, which is crescent in form with the two corners rounded. Horizontal furrows are sometimes seen, but they have nothing to do with syphilis. These furrows usually are the result of some one of the exanthemata. The peculiar state of the so-called Hutchinsonian teeth is due to stunted development of the first formed portions of dentin, and an interesting

fact is that they are rarely present in more than one of the same family. When the centrals are well marked due consideration should be given them, and if some doubt should exist it is well to look for further evidence of syphilitic taint.

Syphilis is second to no other disease in pathological importance. It is one worthy of the most profound thought

and consideration when we find it present in any form, and all suspicious ulcers and tumors of the mouth should be considered serious until a diagnosis has been made. Mouth lesions are one of the most obstinate features, and although it is beyond our territory to treat the disease constitutionally, yet we are indispensable in the local treatment of its oral manifestations.

PROCEEDINGS OF SOCIETIES.

MARYLAND STATE DENTAL ASSOCIATION.

First Quarterly Clinic, December 5, 1903.

THE first quarterly clinic of the Maryland State Dental Association was held in the Royal Arcanum building, Baltimore, on Saturday, December 5, 1903.

Afternoon.—CLINICS.

The entire afternoon was devoted to the following clinics, which were discussed in the evening session:

Dr. A. C. BREWER gave a clinic on "Removable Porcelain Teeth in Bridge-work."

Dr. G. MARSHALL SMITH—"Removing Pulp by Cocain": The only excuse I offer for presenting this subject of removing pulps with cocain-pressure anesthesia (which, by the way, is not a new method) is that it is not universally used, and with the hope that someone may be led to adopt the practice which has given me such satisfactory results. My method of procedure is that commonly practiced, I think, and is as follows: Remove the débris in the usual manner; expose the pulp if possible, and place a small crystal of cocain in the cavity. Over this a pledget of cotton saturated with a very strong solution of cocain in adrenalin

chlorid is placed. Now, place a piece of vulcanizable rubber in the cavity and exert quite gentle pressure, increasing the force gradually for one or two minutes, at the end of which time the pulp can usually be removed without pain. If there be any sensation the application of the cocain solution is easily repeated. Any tendency to hemorrhage is controlled by the adrenalin chlorid.

Dr. E. A. BRYANT, Washington—"Repair of Facings for Crowns and Bridges": In case of breakage of the facing from the crown of a bridge, first cut off the projecting pins of the broken facing and with a corundum wheel smooth all uneven parts. Select a new facing, and mark with the facing where the pins will carry it to the proper position on the backing, paying no attention to the position of the old pins. Where the pins leave their mark, drill a hole for each with a drill just a trifle larger than the diameter of the pin, then take a fissure drill the same size as the previous drill and cut from one hole to the other, making it into a straight slot. This needs to be done as smoothly as possible, so that when the facing is pushed

to place the new pin will fit snugly. Fit the facing into place as perfectly as possible. Next take a small rat-tailed file and cut a few notches into the inner side of the two pins, apply some tinner's flux, and solder the two pins together with tinner's soft solder. With a file, square up both sides even with the edges of the pins, leaving it a little flush, then push the facing to place, filing a little more if necessary, but only enough to allow the facing to go to place. Next, remove the facing, apply some cement to the pins and the inside of the slot, and set the facing, leaving it until the cement hardens, then smooth down with a corundum wheel until flush with the backing, and polish. This makes one of the strongest repairs, even when the backing is not more than one-sixteenth of an inch thick, as is sometimes the case in both crowns and bridges.

Dr. E. E. CRUZEN—"The Carving of Porcelain Crowns": In my clinic I attempted to carve a tooth in porcelain, and I also showed several specimens of bicuspids and molars carved entirely from the porcelain body. My special object was to show the manner of handling and carving the material. I do not know that I have shown anything new, as I presume all are more or less familiar with the manipulation. My trouble when I began porcelain work was that I used the material too soft; I did not remove the moisture sufficiently. Now I remove the moisture until the porcelain is hard enough to give off shavings when carved with a sharp instrument. Another point of my clinic was the use of platinum pins for strengthening teeth with long cusps. In such cases I use a pin for each cusp. Some porcelain workers take issue with me on this point, claiming that the pins weaken the crown, and that if much strain be brought to bear on them they break off. I had trouble with these cusps breaking off before I began using the pins, but since that time I cannot recall a single failure. In my experience I find that the pins strengthen the cusps.

Dr. D. GENESE, Washington—"Pre-

vention of Oxidation in Amalgam": My clinic consisted simply of a method of preparing an amalgam filling so that it would not oxidize after being placed in the cavity. Some parts of the process have been known for a long time, but I think some will be new. I think it was in 1884 that I first brought out the point of treating amalgam with acid to facilitate mixing. Since then I have gone farther in the treatment of the amalgam to prevent oxidation after being placed in the mouth. The alloy and mercury are mixed with the aid of dilute sulfuric acid, to this is added caustic potash diluted with equal parts of distilled water. This last preparation is poured on the amalgam and sulfuric acid and left for a short while. The acid and potash are then poured off, leaving the amalgam exceedingly bright. The amalgam is then washed with alcohol and the excess of mercury squeezed out. An amalgam treated in this way can be placed in a cavity with warm instruments, and in ten minutes it is ready to polish. The amalgam will remain in a very bright condition without any oxidation. I have many fillings treated in this way that have been in teeth for five years and longer, and are now just as bright as when inserted.

Dr. C. M. GINGRICH—"Non-cohesive Gold Filling": The clinic consisted of inserting a small approximal filling in a central incisor, cutting a V-shaped space between the teeth for the double purpose of gaining access to the cavity and of making a self-cleansing space between the teeth. The V-shaped space is cut so as to extend from the labial to the lingual surfaces, forming the smallest point of contact at the labial surface. The enamel surfaces are cut concave to afford a more readily cleansable surface. The filling was made with Abbey's non-cohesive foil.

Dr. C. J. GRIEVES—"Bands in Contour": Dr. Grieves demonstrated a method of contouring crowns by cutting the band curved instead of straight. This, the clinician claims, gives an accurate fit at the gum margin and allows

the band to flare at the point where it comes in contact with the adjacent teeth, giving the necessary contour. In case the contour was too much, little nicks may be cut in the band to enable the upper edge to be drawn in to the proper contour. He also claims that this allows for solder at the edge of the band when soldering the cusp, and does away with the trouble of solder running inside the band and interfering with the fit of the crown.

Evening Session.—DISCUSSION OF THE CLINICS.

In the evening at 8.30 o'clock the society reconvened at the Baltimore College of Dental Surgery, Dr. W. G. Foster presiding, and the following discussions of the clinics took place:

Discussion of Dr. Gingrich's clinic.

Dr. W. A. MILLS. I would like to know just how much tooth-substance you cut away in making this V-shaped space. Do you cut as far as the dentin?

Dr. GINGRICH. I cut until I have room enough to fill the cavities.

Dr. C. C. HARRIS. I want to say that I saw Dr. Gingrich's clinic and examined the filling very carefully and I regard it as an excellent piece of work. It was a simple filling it is true, but it does not necessarily mean that a filling must be large to be beautiful. I think most of us will acknowledge that very frequently small fillings are more difficult than large ones in certain localities. I am sure that had the filling been double the size it would probably have been doubly as easy to fill. I was struck with the beautiful preparation of the cavity and with the cutting away of the lingual surfaces of those two teeth. I really regard such work as that filling as a work of art. If these teeth had been forced apart by the ordinary methods of separation, and the lingual wall had not been cut away, I think the surfaces between the teeth would have been more susceptible to discoloration and would never have had the appearance they now have. But being separated from the rear, allowing the light to fall to the rear, these teeth

will always have that beautiful transparency that is so helpful to a natural appearance. As for durability, I am sure that filling will be there twenty-five or forty years hence. There is simply no limit to the time of service of a prepared cavity and filling of this kind. It is not necessary to cut them from the front—that would be objectionable—but cut from the rear, and put in soft foil as Dr. Gingrich has done.

Dr. G. MARSHALL SMITH. Dr. Gingrich stated that he cut away enough of the tooth-structure to fill the teeth. For fear that his statement may be wrongly interpreted, I will say that the doctor cuts away enough of the structure to fill the tooth—that is, enough for him to fill it, but probably not enough for some of us to fill the same cavity. The cutting, however, was not very extensive, and did not extend to the dentin.

Dr. EMORY A. BRYANT, Washington. I had the pleasure of looking at Dr. Gingrich's filling, and like the other gentleman I must say that it was a work of art. When the tooth-structure is in fair condition, I do not think it is improved by cutting away this enamel to get into it. I have seen a good many fillings of this character put in by cutting away bicuspids and central and lateral incisors until they looked like a set of saws in the mouth. These fillings will probably stay in and be as good twenty years after, but the question is whether it is advisable to cut away good sound tooth-structure, any more than is absolutely necessary in order to get the filling in and get the contour of the teeth replaced by gold so as to reproduce the natural shape of the teeth.

Dr. M. F. FINLEY, Washington. I would say that I examined the operation and was much pleased with it. The cavity was in an ideal position for such cutting away, and I would say for Dr. Mills' benefit that the tooth was not cut enough to expose the dentin. I would say that, in that case, any other operation attempting to restore the contour would have been a failure, so far as the filling was concerned, inside of eighteen months. I think Dr. Gingrich's pro-

cedure was the only proper way it could have been done to make a success.

Dr. G. MARSHALL SMITH. I was much impressed by what Dr. Bryant said regarding cutting sound tooth-structure. I think it is only sensible and reasonable to assume that the more easily teeth can be cleansed the less the liability to decay, other things being equal. The highest type of teeth, we all know, have the smallest point of contact. Nature, however, does not always provide this type, and where they do not exist I think it is the duty of the dentist to bring about that condition as nearly as he can. Therefore, I certainly approve of the cutting away of teeth so that there may be only a small amount of surface in contact, and so that all surfaces can be easily cleansed.

Dr. B. HOLLY SMITH. It seems to me that it is unfortunate that a definite and specific description of the operation—the *modus operandi*—might not have been had before the discussion. There can be no question as to the serious importance to us as dentists that we have a fair understanding of this contention which Dr. Gingrich has made, and which Dr. Harris has seconded, and which those who have spoken have approved. Some years ago I heard a statement that more nearly met with my approval than any spoken along this line in the discussion. It was something to this effect, that in the incisal region the ideal use for non-cohesive gold was found. Many of us who have followed some of the older operators in caring for mouths in which in the bicuspid and molar region these wide V-shaped spaces had been cut have been compelled to resort to extensive contour to reproduce tooth-structure which had been taken away for the purpose of securing access to cavities in order to fill them. Food has wedged into these spaces, the normal gum line has been forced away, and decay recurred. In others these spaces caused so much discomfort and annoyance to the patient that, as I say, we were compelled to resort to extensive contour for the restoration of these surfaces. I am satisfied, however, that in the incisal

region our practice has drifted too far away from this old-fashioned but thoroughly successful practice of removing the linguo-approximal angles of the teeth and the introduction of non-cohesive gold, and the thorough polishing of these surfaces so that no food will lodge; where the motion of the tongue and the influx of fluids, water, etc., taken into the mouth, will keep these surfaces clean. We cannot help but admire the wonderful results of such operations, and there is no operation with cohesive gold that can compare to them in usefulness and in saving properties. I have seen many operations of this character done by Maynard and Cochran, the operations lasting as long as the patients, and a man is fortunate to have seen some of these operations as I have. I therefore think that a demonstration of this kind is not at all untimely, and it is much to us to have had the opportunity to see this character of work.

Dr. GINGRICH. I am very grateful for the complimentary remarks made of my operation. We see so many of these teeth with small cavities where they are in contact almost from the lingual to the labial surface from the gum margin to the cutting edges. These surfaces should be cut away sufficiently to give access to the cavity, and this cutting will improve conditions at these points. I have seen teeth filled by Dr. Gore—in fact, I have one in my own mouth—that never decay when the enamel is removed and the surfaces properly polished. I do not believe that these teeth are as susceptible to decay after the enamel is removed. With regard to what Dr. Smith says of this work in the bicuspids and molars, it has never been my experience that we had all the bad results he has pictured. The teeth are not cut on a straight line through the interproximal spaces, but in a V-shape, widening from the labial to the lingual surfaces, and these surfaces are cut concave instead of convex. There is no room for food to lodge in these spaces, and it has never been my observation that we had such bad results as pictured by Dr. Smith from the work of the grand old men of our profession.

Discussion of Dr. Genese's clinic.

Dr. C. C. HARRIS. Whenever I see a simple thing so thoroughly practical and useful, I think, if I can say a word to encourage someone to take hold of it, I have accomplished a good purpose. It seems to me that as far back as I can recall I have been using dilute sulfuric acid in amalgam work, and the objects are several fold. In the first place, if you attempt to mix an alloy with mercury without the use of the acid it may take five minutes to get a thorough mixture, and then to my mind the mixture is not a spontaneous or homogeneous one—the word homogeneous means a great deal in this connection; while if you use dilute sulfuric acid the mercury takes hold instantaneously, almost like an electric spark compared with the slow method of mixing in the hands. In using the word homogeneous I want to say that an alloy that is mixed quickly, having all the particles of the alloy soften as near the same time as possible, will certainly give better results than a mass in which a part of the particles are hardening before the larger particles are softened, and so you get a homogeneous, rapid-setting result by using dilute sulfuric acid with the alloy.

The little rubber mortar and pestle used by the clinician I want particularly to commend, because I have used it for a number of years, and from the satisfaction I have had in its use I wonder that everybody does not use it. I am not familiar with the potash solution. Apparently, in the clinic today you would see a brownish powder come off from the mixture when the potash solution was added, and if that really takes the oxid from the mass and prevents future discoloration it is an easy and good thing to use. Of course I take the clinician's word for the practicability of this method. He is a practical man, and we cannot think that he would come before us with a statement that was not entirely correct.

Dr. F. F. DREW. Do you give the filling any attention after crystallization?

Dr. GENESE. In what way?

Dr. DREW. Do you polish it down after it crystallizes?

Dr. GENESE. I take as much care in finishing an amalgam filling as I do with a gold one. I use an automatic mallet to condense the amalgam. The last part of the filling is put on with heated instruments; after this is done I then polish with wheels made of cuttlefish, and then with a special preparation of whiting, and you would be surprised at the beautiful finished filling obtained.

Dr. B. HOLLY SMITH. It seems to me that the demonstration is at variance with what we know of some experimenters' work. Dr. Black has shown that the aging of amalgam artificially prevents shrinkage and expansion, but this method which is recommended is nullified by the agents used, for these agents destroy the result of this aging. To say that amalgam, because it had been subjected to the potash treatment, would not oxidize would be to say that you have removed the result of oxidation since its manufacture. Now, when we do away with this advantage of aging amalgam we simply start afresh. If an amalgam filling be highly polished you may not expect rapid oxidation, but to say, in the case of tin amalgams where you have tin in proportion of fifty per cent., that they will not discolor is to say something that we cannot credit. Tin alloy will oxidize, I do not care how much acid you put in it. You may prevent oxidation by dissolving all the tin, but that tin amalgam will not oxidize is a statement that I think unwarranted.

Dr. HARRIS. I do not like to be on the floor too much, but I would like to answer Dr. Smith. It strikes me that as long as we have metal we will have oxidation, and so I made the statement that as Dr. Genese is a practical man, and is stating his experience, we have to accept it as true until we prove it otherwise. But when Dr. Smith assumes that the use of dilute sulfuric acid will bring the alloy back to its original form, he assumes that which I think is erroneous. There is something peculiar about a new alloy that I do not think anyone can explain satisfactorily—that is, why a

new amalgam will set so quickly, often so quickly that we can hardly make use of it for a filling. That is the case with all new amalgams. If that alloy, however, is many months old, from six to twelve, it presents a different consistence. It does not crystallize so quickly, and we can work to a greater advantage and with more satisfaction, and we feel that we are doing better work when it is aged. I do not think anyone understands why it is, but it is a simple demonstrable fact. I can assure you that the use of dilute sulfuric acid, after an alloy has become many months old, has no tendency to bring it back to that original state where it crystallizes so quickly as it does when new; that theory does not hold good at all.

Dr. RICHARD GRADY, Annapolis. Did I understand Dr. Smith to say that dilute sulfuric acid would remove the tin from an amalgam?

Dr. SMITH. No, sir. I did understand, however, that the claim was made that all the oxidizable particles were removed from the amalgam, and my understanding is that the oxidizable portion was removed by the acid treatment.

Dr. GENESE. I did state that the combination used removed all oxids from the metal.

Dr. SMITH. I don't know anything about amalgam. I simply wanted to say that the claim of the clinician was at variance with all that I know of the experiments of Dr. Black. He made many expensive tests in aging amalgam artificially for the purpose of improving it. He also made tests to improve not only the working quality of the amalgam, but to prevent it from shrinkage or expansion. I think Dr. Black said, as the result of those experiments, that not only the use of dilute acid, but even alcohol, would interfere with the quality given it by aging. He proved by tests made in dies that nothing was gained by this sort of treatment. I cannot take so positive a stand as Dr. Harris has done in regard to this, as he speaks from the results of his own experiments. I simply have to say that the statements made by the clinician are at variance

with the opinions of recognized authorities on the subject of amalgam.

Dr. W. A. MILLS. For years I used dilute sulfuric acid to wash out the oxid of metals, but I gave it up some eight or nine years ago, as I found that my fillings would all turn black. In late years I have been inserting amalgam fillings in the following way: I leave a good quantity of mercury in my filling, so as to leave it rather plastic. I pack this with the same care as gold, and when the mercury comes to the top I wipe it off. I pack on the amalgam until the cavity is more than full, and I leave that for about five minutes, and then remove the surplus. I never pretend to finish an amalgam filling at the time of inserting it, but at the next sitting I proceed to finish it. I have had cases where the pulps being nearly exposed in the teeth, I having cleaned out the cavity and lined it with gutta-percha, have filled it with this amalgam. Possibly for one or two days the patient would complain of response to heat and cold, and after that it would be perfectly comfortable.

Dr. GINGRICH. How do you know that the teeth are not dead?

Dr. MILLS. For the simple reason that they will respond to heat and cold.

Dr. HARRIS. The secret of Dr. Mills' fillings remaining bright is due to the amount of mercury left in the alloy. Anyone who has paid much attention to the action of mercury in the amalgam will know that the larger the amount of mercury left in the amalgam, the brighter the filling will be.

Dr. GENESE. The matter under discussion has been before your notice for many years. Dr. Smith mentions Dr. Black as his only authority. I have been working in metals for thirty years. When I made the statement that an alloy of 25 per cent. of gold, 25 per cent. of silver, and 50 per cent. of tin could be made into a metal bar, it was disputed, but The S. S. White Dental Manufacturing Co. were kind enough to make an assay of that bar, and they stated that the exact percentage of each of those metals was in that bar. What I tell you

tonight about the prevention of oxidation, I have found from experience. Fillings that I have put in for the last five years I have noticed with surfaces as bright as when they left my hands. By the process demonstrated and by packing the amalgam solidly there is no possibility of oxidation in the filling. Oxidation of metals takes place only on the surface. One may take a piece of metal and while it may be oxidized on the surface, it will be bright through and through. If you rub that oxidized surface it will become bright again. In many cases the friction of mastication will keep a well-filled tooth bright.

Dr. Harris saw me mix this material today, and he saw, as the potash was added, a little cloud form over the material. That was the action of the acid and alkali fighting against each other. This process removes the oxid from the metal. In an alloy the shavings are oxidizable through and through and if you do not remove this you do not get rid of the oxid and the filling is continually turning black. I shall be pleased to present some fillings for examination, sometime, to prove that this process does prevent oxidation.

Discussion of Dr. Bryant's clinic.

Dr. CHAS. DIEDEL. In my little experiences with Dr. Bryant's method of replacing facings, I must say that I have found great satisfaction from it, and especially in one instance. I had a patient who had in his mouth a gold crown on the upper right bicuspid, and to this was attached a canine facing. Unfortunately this facing was broken in biting, but the pins were left in the facing. Being late in the afternoon the patient was very much embarrassed because he was to appear at a public gathering that evening and was to make a speech. To meet the situation I managed to find a canine tooth that seemed to fit the case, and on examination I found that the backing was very thin, and I was very much puzzled for a little while to know how to overcome the difficulty. I prepared the facing in the regular manner, cutting a little slot in the

backing and adjusting the facing. I found that the backing could be very easily torn in biting, and I soldered the facing on to the backing and reinforced the backing with soft solder. It was not a perfect-fitting facing, but nearly so. This was finished off. It has now been in the mouth for three months, and is just as firm today as when first adjusted.

Dr. RICHARD GRADY. I was very glad to be able to see the demonstration today, as I had read a description of the method in one of the journals, but that description did not make the method sufficiently plain. Seeing the demonstration, however, has made the method very clear to me. It is quite a satisfaction to know how to meet these cases.

Dr. BRYANT. A method similar to this was gotten out by me several years ago, using nuts for the retention of the facings in these repairs. In some cases it was impossible to use this method and get the results desired, and in these cases I have found that I can use this other method and get perfect results every time. Of course, an additional feature of this method is that it is practically inexpensive. It also makes the repair as strong and will stand as much stress as the original tooth.

Discussion of Dr. Grieves' clinic.

Dr. GEO. E. HARDY. In cutting the curve, have you any guide as to its extent? How do you estimate the amount of the curve, as in some teeth the recession of the gums is more than in others?

Dr. HARRIS. I want to say that I saw both of Dr. Grieves' demonstrations, and the cutting of the curve in the band particularly struck me as being a perfectly practical thing to do. Of course, in the making of crowns we have all probably been striking at that in our efforts, and I think that now we have a point that will be a great help to us.

Dr. GENESE. The method of cutting a perfectly adjusted band is very simple if you will use pure lead foil in taking the measure. Roll the lead out into thin sheets, and cut into little strips a little wider than necessary for the measure. Bend this around the portion of

the tooth to be crowned, and with an instrument outline on the measure the gum line. When this is taken off the dimension and shape of the crown is exact. In cases of recession you have no trouble in getting an accurate measure. The lead used should be pure so that it can be readily bent.

Dr. GRIEVES. How do you provide for contour in that method?

Dr. GENESE. You can raise the strip as high as you wish, and allow for the contour in the lead strips, which will give you the shape for the band.

Dr. GRIEVES. I do not find that the lead strips take the shape of the tooth at the point where the contour is to be made.

Dr. B. HOLLY SMITH. We have all been impressed with the rapid destruction of tooth-structure from the faulty relation of crowns. I have seen many cases in which the crowns had been on only for a short time and the surfaces were rapidly destroyed as the result of failure on the part of the person who inserted the crown to recognize the essential relation between the artificial substitute and the enamel tooth-structure adjacent, and I want to say that the clinician's method of securing the proper contour is delightful.

Dr. E. E. CRUZEN. I want to congratulate Dr. Grievess on his clinic. I watched the clinic a little while with a great deal of interest and profit. I have tried on several occasions to obtain contour by cutting the band as illustrated, that is with a straight band with the ends cut at an angle. I found on fitting the band and trimming it down it would be too large. It was a source of considerable trouble to me, and I went back to the old way. I think now, however, I see the way clear to get a better fit and a better contour.

Dr. GRIEVES. In answering Dr. Hardy's question, I would say that I use the curved band where there is very little or no recession on the buccal side. Where there is much recession on the buccal side of a bicuspid I stick to the old method of fitting the band. I have found the curved band very satisfactory

where the tissues are in a normal or nearly normal condition.

Discussion of Dr. Marshall Smith's clinic.

Dr. HARRIS. Dr. Smith's demonstration of his method of removing pulps struck me as being very useful. If we have a pulp of a tooth that has been aching and paining we have a high state of congestion and inflammation. We all know that when we have to deal with these congested pulps they are more difficult to destroy and remove because of the congestion, as it will not permit the agents used to be absorbed on account of this disturbed circulation, and this is especially the case with cocain and arsenic. We frequently have to make several applications before we get satisfactory results, whereas in case of a healthy circulation only one application suffices. The point that impressed me most is that the use of this adrenalin chlorid would be very advantageous in these cases because of its constricting influence, by which it would relieve this congestion and put the pulp in a condition to absorb the cocain and bring about the natural effect expected from the use of cocain, and therefore I consider the use of this combination of the two drugs as a most useful and helpful one to us. I have attempted to take out many pulps in this congested condition with cocain and have experienced many failures. I believe now, that had I known of this method of the use of adrenalin chlorid it would have answered the purpose perfectly.

Dr. MARSHALL SMITH. I would simply say that this method is not original with me. Dr. Clyde Davis was the first to recommend it to me.

Discussion of Dr. Cruzen's clinic.

Dr. C. J. GRIEVES. I want to say that it was my pleasure not a great while ago to see Mr. Robert Brewster do some very beautiful cusp carving, and to my mind it is the ideal thing. I have for some years taken the pains to swage the cusps in gold to get the proper occlusion, and if the work can be done as he showed,

without using a facing to carve from, I think we have almost reached the ideal.

Dr. GENESE. One feature has been overlooked in discussing cusp carving; that is, shrinkage. When we take into consideration the fact that even the highest grade porcelain will shrink one-fifth more than the low-fusing one, this is a very important feature. My method has been to make a mold of plaster somewhat larger than I want the tooth to be, pressing the material in well, and when this is dry open the halves of the plaster; one then has the porcelain more easily formed than by carving, and more accurate, at the same time allowing for shrinkage.

Dr. HARDY. I would like to ask how the pins are fastened to strengthen the porcelain.

Dr. CRUZEN. The pins are soldered to the cap; one for each cusp. In the case of an upper first bicuspid I use two pins for attachment to the root—one for each canal—and allow these to extend through the cap so as to give the required strength to the two cusps.

There are many little points overlooked in a demonstration of this kind that are of importance, but being familiar with them myself I may overlook the fact that they may not be quite so familiar to others. One point I failed to mention in my description—that of shrinkage—is very important. I presumed that all were familiar with the shrinkage of high-fusing porcelain. All high-fusing porcelains shrink about one-

fifth of their size, and after some little experience in the handling of these materials you can judge the shrinkage and allow for this very accurately in the building up and carving of the porcelain. For instance, I showed two crowns today that were practical cases, and I made the statement that they were made with one baking—I want to correct that statement now and say that they were made with two bakings but only one carving. I first put on the foundation body and fuse that, I then build up the tooth and carve, allowing just enough for the shrinkage to give the proper occlusion after the second bake. I have adopted the porcelain crown almost entirely to take the place of the gold-backed crown. Since 1893 I do not think I have made as many as twenty-five gold-backed teeth for any of the six anterior teeth. I have done considerable amount of this work, but I confine myself almost entirely to porcelain work for the anterior teeth. In the bicuspids also I have made very few gold crowns, and I occasionally put a porcelain crown on the molars, and I have not the breaking of which others complain.

Dr. HARDY. Do you use platinum or gold solder?

Dr. CRUZEN. The pin for attachment to the root is soldered to the cap with platinum solder, but the pins that furnish the additional strength to the cusps are attached to the cap with pure gold.

There being no other business before the society, motion to adjourn was made and carried.

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Thirty-fifth Annual Union Convention.

THE thirty-fifth annual union convention of the Seventh and Eighth District Dental Societies of the State of New York was held in the assembly room of the New Osburn Hotel, Rochester, N. Y., October 27, 28, and 29, 1903.

FIRST DAY—*Morning Session.*

The convention was called to order at 11 o'clock by Dr. F. Messerschmitt, Rochester, president of the Seventh District Society.

The reading of the minutes of the last meeting was postponed on account of the absence of the secretary.

The President then read his annual address.

The President then introduced Dr. A. OSGOOD of Bath, N. Y., who read the following paper:

THE VACUUM CHAMBER.

The subject of the retention of full upper dentures has been threshed over many times, but the question seems to be quite unsettled as to what is the best procedure after taking the impression for an upper plate. That it is the correct thing to make a careful examination of the tissues covering the arch and alveolar ridge, with a view to relieving pressure by the finished denture on the harder parts, we will all agree. In 1901 there was published in the first three numbers of *Items of Interest* a series of papers, nearly all from instructors in prominent dental schools, and all relating to the use and value of the vacuum chamber. Like every other question on lines of practice that is discussed, there was a diversity of opinion, a few condemning this device, which has been relied upon so many years, but the large majority

favored the use of some sort of a vacuum, or air, or suction chamber, whichever you choose to call it.

The papers referred to made very interesting reading, and it would be well for everyone who makes sets of artificial teeth to study them carefully, for they impart much useful information. Two or three of them contained some bad teaching. Referring to the thickness of an air chamber, one says it should not be more than the "sixteenth of an inch," implying that one of that depth would be permissible. Very much too deep! Another says, "About the thickness of a five-cent piece." Also a great deal too thick. Still another writes, "Where resorption has been very great, and the mouth has become quite flat, after the chamber is filled with the tissue, which will be more or less spongy, the adhesion continues, and the chamber acts something like the rugæ in keeping the plate from having a lateral motion, which causes it to trip." He evidently goes for a *deep hole* to retain a plate in position. The students that sit under this kind of teaching naturally follow it in their practice when they go out to fill their positions as dentists.

This paper is not intended to controvert the opinion of those who do not believe in the value of a visible air chamber, but the aim of it is to condemn the manner in which so many dentists abuse what they suppose to be a good thing, by inserting such clumsy, ungainly, positively injurious, utterly useless, ill-looking things that are intended to produce a vacuum under a plate. Many of these contrivances do no harm, but surely no good. Some are too small in area; others too near the heel of the plate to be of

any advantage; others are placed without a single idea of the requirement; but the worst of all are those deep excavations that have such a pull on the mucous membrane that it becomes irritated and congested in its effort to fill this cellar-like cavity.

Not long ago I had a case of a partial plate, carrying only three teeth, with a deep, square-edged chamber that had become filled by a morbid growth, and was causing real suffering of a serious nature. On removing the plate I found what should have been the hard palate an inflamed mass, scarlet red, with an angry expression that accounted for all that was complained of by the wearer. The plate was discarded, and it required weeks of time and treatment to bring the parts to a normal condition. Another plate was made, provided with a thin vacuum, and is worn with safety and comfort.

It is unnecessary to enlarge upon the unpleasant conditions arising from the faulty manner in which so many dentures are constructed, but consider how best to avoid them. I will briefly describe what I believe to be the best method of making a vacuum chamber. For the form I use a metal composed of equal parts of lead and pure tin. This is rolled in sheets of Nos. 26, 28, and 30 gage. These three thicknesses are all that is required. Always cut a new form for each case. It should never reach nearer than a quarter of an inch to the heel or back edge of the plate. It should extend forward sufficiently to prevent rocking on the hard part of the palate. It should have no square edges, but with a fine file should be nicely beveled. It should be broad enough to cover the horizontal portion of the hard palate. Do not give it a heart or any other fancy shape, but let it conform to the general form of the arch of the mouth. After the metal form is pressed down smoothly and fastened to the model in the position desired, on either side of the hard part of the palate, scrape a little plaster from the model, extending this slight change a little farther in the rear than the plate will reach, so there will be a snug pressure in the soft tissue at those points

when the finished denture is placed in the mouth.

A good many dentures made with the air chamber in the manner I have outlined have been worn, to my knowledge, for from twenty to thirty years—although some of them were intended as temporary plates—and all of them free from any morbid condition, so far as I have seen, and have “held up” to the satisfaction of all concerned.

Like others, I have had failures in my fits, but to overcome them have never resorted to the deep vacuum chamber.

Discussion.

Dr. C. W. STANTON, Buffalo. This subject is like many others—it has been threshed over many times and we will probably never agree as to what is the proper thing. I have long since discarded the use of air chambers—that is, the air chamber with sharp, well-defined edges—and I have been content to use simple reliefs, and then only in cases where the patients are exceedingly nervous. It is true that in many cases the well-defined air chamber helps to hold the plate in position for the first few days, but in the course of a short time it is generally filled up with soft tissue. The air chambers advocated by the essayist are not objectionable, but the great majority of air chambers are shaped with sharp well-defined edges, and these only tend to irritate the mucous membrane. I commend the essayist's practice and ideas, generally speaking, but in my own practice I have dropped the air chamber entirely and use simple reliefs.

Dr. W. W. COON, Alfred Center, N. Y. In those cases requiring some additional means for retaining a denture in place for the first few days, I have adopted a suggestion that I got somewhere of making little cup-shape impressions all over the top of the plate—not deep, but light impressions; this gives a strong retentive surface that will serve until the plate is adapted to the tissues of the mouth.

Dr. C. H. LAND, Detroit, Mich., said that the theme of the paper was a subject in which he had been very much interested for a number of years, and one

of which he had made considerable study. As the result of his study he has long since discarded the use of air chambers, and believes that the use of reliefs such as Dr. Stainton had spoken of is the correct solution to the problem of retaining artificial dentures. The sooner the profession abandons the idea of artificial dentures being retained by air pressure, the sooner they will come to an intelligent understanding of what they are working for. Atmospheric pressure is not utilized as a means of holding a denture unless a vacuum be created, and this is practically impossible in the so-called vacuum cavities. The moment the edges of the air chamber touch the surface of the palate, an air cushion is formed which is the means of holding the plate. It is impossible to use atmospheric pressure in holding a denture in the mouth, as all the air would have to be exhausted from the cavity, and should this be practicable the pressure would be greater than any tissue could stand. Plates are retained by molecular attraction between the surfaces of the plate and the tissues of the mouth. The reliefs spoken of are simply to relieve the pressure in different portions of the mouth, and should be so arranged as to balance the denture, and not tax the tissues at one point more than at others. The perfect adaptation of the plate would permit a minimum amount of saliva to flow between the denture and the tissues, thus producing a maximum amount of adhesion. Whenever he makes an artificial denture Dr. Land plans the reliefs not with the idea of utilizing air pressure, but with the idea of molding the plate so that a perfectly balanced contact shall be obtained, and a state of equilibrium established between the denture and the tissues.

Dr. H. S. MILLER, Rochester. I have long since discarded the so-called air chambers, but I have felt the necessity of relieving plates where they cover hard tissue. In order to accomplish this I roll out a piece of block tin. Some use tin and lead combined; either will answer the purpose. I roll this out very thin, to probably No. 30 gage or less, as best adapted to each individual case. I make

the tin for each individual case, and with it cover as much of the hard palate as I find necessary. With regard to Dr. Land's assertion about getting no air pressure from the vacuum chamber, I thought there was such a thing as air pressure in retaining dentures, but if we should get the full volume of that pressure, it is a fact that it would be fifteen pounds to the square inch, and no mouth would stand that. We do not want that much, but in covering the mouth, and adapting the plate as accurately as possible, we remove at least a portion of the atmospheric pressure. There is less pressure of the atmosphere on the under side than on the exposed surfaces, so that we get a slight pressure, as much as we require.

Dr. W. A. WHITE, Phelps. The discussion of a question of this sort benefits us all. Dr. Land's discussion reminds me of a case I have in which I have made five dentures, and have not yet got one to fit. The mouth is one with a very high arch. I have used all devices known to me, and have used vacuum chambers of different depths, scraped the impression opposite the hard places as Dr. Stainton suggested, and yet the plate will not fit. I would like to ask what should be done in a case of this kind.

Dr. LAND. There is no use in relieving a denture except on the horizontal surfaces. Where you have high perpendicular walls it is best to cut a little rib to help create attraction. If you will relieve a denture only on these horizontal surfaces, and not on the perpendicular walls, you will get the maximum adhesion.

Dr. STANTON. I think a few of us remember Dr. S. B. Relgay, who originated a device for holding a plate in position. It consisted of a circular piece of rubber made in different sizes, that was placed in the plate at the roof of the mouth. It was not molecular attraction that held those plates in the mouth, it was atmospheric pressure.

Dr. LAND. What held the plates in those cases was nothing more nor less than the measure of adhesion of the saliva.

Dr. WHITE. Dr. Land seems to be familiar with all methods of holding plates in the mouth, and I would like to ask if he has heard of the flexible vacuum cavity. I have seen cases where nothing would seem to benefit the case except those flexible vacuum cavities. I would like to ask what held the plates in those cases.

Dr. LAND. The surfaces were simply relieved enough to increase the adhesion. There are men in Paris who have made experiments to show exactly the measure of adhesion of all fluids, and it has been demonstrated by scientific experiments that it is the adhesion of the saliva that holds a plate in the mouth. We all know that when a plate is placed in the mouth with the surfaces dry it will not stay, but if moistened it will stay, showing the adhesion by means of the fluids. The plates should be adapted as accurately as possible with slight reliefs opposite the hard places, so that we will get the minimum amount of saliva between the palate and the plate. The minimum amount of water between two solid bodies will give the maximum amount of adhesion. You cannot create a vacuum unless you exhaust all the air. You have to establish a state of equilibrium, and that is all there is to it.

Dr. J. REQUA, Rochester. I agree with Dr. Osgood as to his construction and shape of air chambers, with one exception. I use about the same thickness that he does, but a different form of air chamber. I run the chamber farther forward and extend it over the front ridge; otherwise I agree with his ideas. In a hard ridge in the center, if the chamber is extended farther forward to the front of the mouth it will prevent the backward tipping of the plate. A plate usually rocks when you bite on the front teeth, and the extending of this chamber farther to the front will prevent that.

Dr. E. P. JONES, Rochester. I have not used air chambers for a long time. I think the fit of a plate depends on the adaptation to the roof of the mouth. I sometimes relieve the plate opposite the hard places by scraping the model. If there are soft places in the arch I relieve

those by scraping the impression just a little. A number of years ago I adopted a suggestion made by Dr. Line. His idea was to begin at the outer ridge and form little steps from the gum edge clear up over the arch. These little steps would be probably twice as thick in the center as on the edges.

Dr. OSGOOD. I am very much gratified at the discussion of the paper. I have no controversy for those who get along without using any form of air chamber; I am glad that they can do it. I have nearly always used them myself, and my fight was against those horrible things you have seen here. We see them every day, made by young men who have just come from the colleges. Those that I exhibited, which were about one-sixteenth of an inch thick, were made by college professors. I indorse what Dr. Requa has said with regard to shaping the air chambers. I believe Dr. Requa's idea in extending the chamber farther forward is a good one. I think that is where a great many plates rock—in the front of the mouth. Dr. Land's idea of polishing the plates on the inside is a good suggestion. I had a good deal of practice in making gold, silver, and continuous-gum plates in the office of my preceptor when a young man, and his practice was to polish plates as perfectly on the inside as on the outside. Those two gold plates that I showed were made nearly fifty years ago in his office, and his work was remarkably successful, and the finish on them is as perfect as could be obtained.

FIRST DAY—Afternoon Session.

The meeting was called to order at 2 o'clock by the president.

Dr. C. W. STANTON, Buffalo, read a paper on "The History, Literature, and Utility of Zinc Oxychlorid as a Root-Canal Filling." (Published in full in the February issue of the Cosmos, at page 106.)

Discussion.

Dr. W. W. COON, Alfred, N. Y. This paper is very opportune just now, when

so many materials are being used in canal filling with the expectation of a continued germicidal quality—their greatest merit being the ease with which they are removed! One very important quality of the oxychlorid I did not hear mentioned, viz, bleaching. In the anterior teeth this is very satisfying. It has been my practice for a long time to refrain from much drug-pumping in teeth where avoidance of discoloration was most desired, but to mechanically clear away, using the canal drill freely, but not enlarging the foramen, and not making an artificial one if I could help it, using dioxid hydrogen in flooding until satisfied with the condition, then sealing the apex with gutta-percha. Use a smooth broach the end of which is just a little too large to pass through the foramen, dip it into a solution of gutta-percha in chloroform, which is then allowed to evaporate, leaving a thin film of gutta-percha on the end of the broach; this can be carried to the ends of the roots, and by a slight manipulation a minute plug is placed where desired. To prevent irritation from subsequent procedure, re-flood the canal with H_2O_2 , retaining it in the canal and crown cavity with bibulous paper or cotton, and apply hot air. When satisfied with this procedure the canal is cleared of an excess of moisture and filled with quite thin zinc oxychlorid, which is treated also with hot air for a few moments; then, after pressing bibulous paper into the pulp-chamber to take out the excess of liquid, the canal filling is completed with a little stiffer mix of oxychlorid.

This result is the antithesis of the result after treating an abscess through the canal with mercury bichlorid solution followed by a gutta-percha filling. This latter method stops the abscess and keeps the tooth in peace all right, but the crown takes on a sunburnt hue that is difficult to correct. I believe with the essayist that oxychlorid is the best material for permanent canal filling, but I want to be well satisfied with the root condition before placing it farther in a canal than a good stiff drill may be used. There is one special use which gutta-percha has

which makes it invaluable; that is when the tortuous canal has been perforated by a drill accidentally—and accidents will happen, even when a root is not very crooked. There are such things as tortuous canals in straight roots, and most honest men in full practice sooner or later have this sort of an accident to contend with—if not from their own drills, from that of some brother craftsman. In these cases gutta-percha is best tolerated.

I have here an upper right lateral with a valuable history. More than twenty-five years ago this lateral was the cause of a serious alveolar abscess that necessitated an operation for necrosis. This happened in one of our largest cities and under the care of a gentleman who deserves, and has, a national reputation. The case went into the hands of another gentleman of the same class who after quite continued treatment filled the tooth as you see it now. An examination of the wear sustained by the gold filling in the crown will substantiate the twenty-five years of service. During all this time the tooth had given no particular uneasiness until a few weeks ago, when a fierce alveolar abscess developed, and the lady insisted on its removal.

Dr. W. V-B. AMES, Chicago, Ill. Dr. Stainton spoke of the craze which at one time raged for capping pulps and filling teeth with oxychlorid, and the disastrous results which followed the filling of cavities, especially approximal cavities, with this material. I have been in dentistry long enough to remember the use of oxychlorid in this way. I remember the coming in of oxyphosphate. I was a student at that time, but was familiar with the uses of oxychlorid for a considerable time previous. Approximal cavities met with disastrous results by the solution of the approximal surfaces when the occlusal surfaces were still intact. The interesting part is that in recent years I have become satisfied that the result with oxychlorid was not the fault of the oxychlorid *per se*, but because the material which was being used was not pure zinc oxychlorid. They were using materials which contained calcium

oxid in order to give them the property of slow setting, as the material had to be slow setting to be used in this way with any satisfaction. I may say that if pure zinc oxychlorid be used as a filling material for initial cavities on the approximal surfaces, it will last as satisfactorily as oxyphosphate or any other filling material. And that leads to the point I want to make. There is a general impression that cement in general, including oxyphosphate, is an unsafe material at the cervical margin. I think the deterioration of such plastic fillings at the gum margin is due to their adulteration with phosphates, or to the fact that the phosphoric acid is diluted with sodium phosphate, to get a slow-setting material which can be trimmed at the cervical margin within the limits of an hour appointment. In other words, it is almost impossible to finish an oxyphosphate filling within the time of an hour appointment without creating a leak in the filling. I have seen straight zinc oxychlorid fillings, where sufficient time was given for hardening, last three or four years without the least sign of solution at the cervical margin such as we are accustomed to see. It can be used in this way by keeping the rubber dam on to keep the parts dry until the material is sufficiently hardened; then, by flowing a slight coating of gutta-percha over the entire surface in order to protect it from the saliva, you will have a filling which will not fail at the cervical margin. I wish I could see Dr. Stainton use this material in all classes of cases. It being a hygroscopic material, there is no question that it can be used where moisture is present. It is very easy to use in the lower teeth, but if we have to operate in the upper jaw, where we have to work through a distal cavity, I would like Dr. Stainton to show how I could be thoroughly satisfied in filling buccal roots of such teeth with oxychlorid.

Dr. STANTON. Tell me how you fill them with anything else, and I will tell you how to fill them with oxychlorid.

Dr. AMES. I feel that I can come nearer passing a gutta-percha cone in a tortuous canal, and follow with a copper,

silver, or zinc wire than I can with zinc oxychlorid. I must say, however, that I have seen oxychlorid root-fillings which showed that they had been placed at the end of the root and forced through the root and pericementitis set up afterward. I am glad to have heard the paper, and I hope Dr. Stainton will give a little more of his method of procedure in getting oxychlorid into tortuous canals.

Dr. STANTON. The paper was too long as it was, and there were many points left to be understood. I do not think that I can do much, but in these tortuous canals I think I can place thin oxychlorid with as much ease as gutta-percha could be placed. I fail to see that there is such a great difference in the working of it. Where you can get any root-canal filling you can get oxychlorid. This has to be pumped into these very tortuous canals with a very fine smooth broach, and if you can put anything else there, I see no reason why the oxychlorid cannot be placed there just as easily.

Dr. AMES. I agree with Dr. Stainton that possibly we do not get the material there frequently, and for that reason after I place the thin oxychlorid I follow with a small wire of zinc, and I feel safer after I pass this wire in, as it possibly takes the place of a space which the oxychlorid has not filled. With this wire you still get the antiseptic effect of the zinc.

Dr. F. E. HOWARD, Buffalo. Dr. Stainton has emphasized in many ways the usefulness of zinc oxychlorid in connection with root and cavity filling. I used zinc oxychlorid for root-filling for a good many years, and I must say that it has been very satisfactory in my hands, although at present I have departed from that practice. I think I have now a material that is better and more satisfactory in the majority of cases, and which can generally be manipulated more satisfactorily, with results certainly as satisfactory, and with the possibility of the least unpleasant results in certain cases. I think I can appreciate the fact that there is no trouble in filling root-canals with zinc oxychlorid, but at the same time cases do come before us where the fora-

men is enlarged sufficiently so that in case a certain amount of this root-filling material passes through it will cause pericemental inflammation and a good deal of trouble and uneasiness.

Dr. Stainton tells us that chloro-percha is not antiseptic. That is very true, but I never fill the root of a tooth with anything without first rendering the root aseptic. I claim that that has to be done with any material in the proper filling of a root-canal. I use for that purpose iodoform, and I very seldom worry about the case any further. I feel that with chloro-percha we can fill almost any root that can be filled with anything else. Where you cannot pass a small broach freely into the canal it is utterly impossible to cleanse every thread of the pulp tissue from the root-canal, but at the same time we can fill that with chloro-percha under almost any circumstances. Wherever you can pass a broach, no matter how fine, I claim you can fill with chloro-percha, and if we can do that we can put the remains of that pulp tissue in a condition where it will do no harm. It will practically mummify the remaining threads of pulp tissue. I have no objection to zinc oxychlorid; I believe it is a good root-filling. It is a material that is acceptable to the teeth, but at the same time I believe in the hands of many it would not be as safe a material to use as chloro-percha after the tooth has been made antiseptic. I feel that chloro-percha in my hands is more satisfactory than the zinc oxychlorid.

So far as the necessity of removing the root-fillings, I must say, and emphasize it, that I never remove a root-filling. In the first place I do not see any necessity for it. When I fill a root-canal I aim to do it as perfectly as possible, and for that reason I do not propose to go over the same territory the second time. But if that point is to be considered, of course the chloro-percha is easier to remove. I never put in a root-filling with the expectation of its removal. If I have any subsequent trouble I treat it from another source.

Dr. STAINTON. Do you have trouble

with root-fillings and have to go into them from the outside?

Dr. HOWARD. There may be a few cases in a few years, but the percentage is so small that I do not consider it. If a root should give trouble, I act as I believe the case demands, but I feel that I cannot improve the filling the second time, and I treat the case from another standpoint.

Dr. F. W. PROSEUS, Rochester. I think that Dr. Stainton's paper is very timely, and something that does good, coming from a practical man. My experience in the filling of root-canals has made me consider it one of the most difficult things that the dentist has to contend with. When I first began the practice of dentistry I filled root-canals with gutta-percha, and I never felt satisfied in my work; and then, as a great many young men do, I drifted from one thing to another, until today I am using zinc oxychlorid to a certain extent. The only trouble I have had from my experience with this material is what has been already mentioned here; sometimes you will have trouble by irritation from the material. And that is the main objection I have to this method. When you have one or two of these cases, and especially if the patient is very nervous and the irritation has been accompanied by a good deal of pain, it makes you feel like saying you will never use this material again. I think that the cleaning of the root-canals is one of the main features leading to success in this work, and undoubtedly those men who advocated the leaving of root-canals with nothing in them were men who left them perfectly clean. Unless the cleaning of the root-canal is done thoroughly and perfectly you will not be assured of success. And as most of the men in the discussion of the papers on this subject admit that there may be some threads of tissue left in the pulp-canal, that is almost an admission that it is impossible in tortuous canals to remove all the debris. Therefore I think that Dr. Stainton in using the zinc oxychlorid is probably doing as near the proper thing as any man can do.

I also think that the ground Dr. How-

ard has taken is a very wise one. If he fills his roots and seals them with a chloro-percha solution I think they will be successful. I was somewhat surprised to hear him say he used iodoform. So far as I know, I do not think it is considered antiseptic, but it is claimed that iodoform is so objectionable to bacilli that it will drive them from the area in which it is present. I believe, however, that is good practice, for we all know that if we take out a root-canal filling in which iodoform has been placed, the canal will be found free from bacteria. Today I am using a root-filling containing iodoform and formaldehyd, and it has been satisfactory. Of course, a small number of cases it is impossible to draw conclusions, but a combination of formaldehyd and iodoform, from my experience, makes a very satisfactory root-filling. It can be readily made into a solution and pumped into the finest canal, and is very easily manipulated. This paste will remain in a very firm state, and in cases where you wish to place temporary caps, the root-canals can be filled with this material and the crowns put in place, and after removal—I have left some on for six months—the substance will be in as perfect a condition as when placed there.

Dr. J. REQUA, Rochester. Dr. Stainton's practice in root-filling is the same as my own, and the material used is the same. I have used zinc oxychlorid for thirty years, almost exclusively, and with almost universal success. I kept statistics of this material for three years. One year I filled 240 root-canals with zinc oxychlorid, and in that year I extracted two third molars that were filled. The next two years I filled about the same number and did not extract one. Where there is a reasonable doubt that I cannot fill perfectly I use the iodoform paste.

Dr. C. H. LAND, Detroit. I would like to ask Dr. Stainton if he has seen roots absorbed and this zinc oxychlorid sticking out, and what is the cause of this absorption?

Dr. STAINTON. I have seen such cases, but I do not think anybody can give the cause of the absorption.

Dr. C. H. LAND, Detroit. I would like to corroborate the statement made by the essayist with regard to the amount of discussion on this subject. As far back as 1867 I can remember that we had extensive discussions of this subject, and it was in evidence at every convention. For ten years I used the same method he advocates with a very large degree of success, and, as he says, it was the custom to use very fine threads of cotton worked up into the canal as carefully as possible. I have also practiced filling these canals with gold, and was successful with this method. Of course there were some canals that I could not fill with gold. I have tried nearly all the different methods and was more or less successful with all of them. In the last few years, however, I have found that gutta-percha points come nearest to the most successful root-canal filling. The canals must be thoroughly disinfected, and must be flooded with some antiseptic material that will remain in the roots. The great trouble, with any method, is the liability of forcing air through the apex in front of the material. Air forced through the end of the root means trouble.

I have used the iodoform paste almost since it first came out, and I have been surprised at the success I have had with it in handling it, you might say, carelessly. I have not had one failure in using this material. I dip the gutta-percha point into the iodoform paste, and take pains that no air is forced in front of the point. I enlarge the canals as far as I dare with a drill, then I use hydrogen dioxid to make it as clean as possible, working this down with a broach. I find that in the lower molars, both first and second, we are most likely to have trouble, and in those cases the filling is easily worked out. I would advise the application of the rubber dam in these cases in the lower jaw. Then we can take our time and with the modern instruments the careful operator ought not to have any failures. If any trouble does occur, you had better treat it from the outside. I am a strong advocate of the use of gutta-percha points, because in using these you are certain to

save teeth after you have brought about an antiseptic condition in the canals.

Dr. STANTON (closing the discussion). I want to say just a word or two in closing. Dr. Howard has given us a description of his method of treating these cases, and I want to say that one of the worst cases I ever had was a contradiction of his practice in this line. It was a case of a young man who came to me with a lower molar which was giving him trouble, and he insisted on my taking it out. I found that it was filled with this iodoform preparation and it had apparently set up inflammation. I never expect to use it; I think it is one of the vilest things I know of.

I want to call attention to Dr. Requa's statement that he had used the method which I advocate in my paper for thirty years with success. I think after thirty years of experience with this method he is in a position to give us something definite in the way of conclusions.

The point brought out by Dr. Land, as to forcing air in front of the filling material, is one which we should keep in mind at all times. That is a thing to be thought of every time we fill a root-canal, and I do not know of any material with which this pressure can be avoided as well as with the zinc oxychlorid.

(To be continued.)

NORTHEASTERN DENTAL ASSOCIATION.

Ninth Annual Convention.

(Continued from page 143.)

DR. DOWSLEY resumed the chair, and announced that the next order of business was a paper on "The Scientific Method in Dentistry," by Dr. EDWARD C. KIRK, Philadelphia, Pa. (Published in full at page 1 of the DENTAL COSMOS for January.)

Discussion.

Dr. L. D. SHEPARD, Boston, Mass. My first impression, in which I think you will all bear me out, was that this is an extremely difficult paper to discuss. In discussing a paper one ought either to applaud it, or condemn it and pick it to pieces, or something of that kind, to make himself interesting to the audience. Now, in this paper I don't see anything to pick to pieces, but, on the other hand, in hearing it read we all agree that it is filled with beautiful expressions of truth.

What the essayist means to do is to explain why the two elements of the profession, the scientific portion, or

those who claim to be scientific, and the practical men, are at more or less variance, and that there is a mutual want of respect between the two. He has explained it in his paper, but it seems to me that there can be made a little further explanation of the question. Doubtless the essayist may have included what I am about to refer to in his paper in further explanation of the condition, and left it out. This is quite often the experience of essayists who find that a good deal of what they have carefully written has to be left out on account of the length of the paper, and perhaps that may have been the case in this instance.

How true it is, as we say, that progress is slow. When a truth is discovered we find many individuals who say that it has been known long before, and many who think with the discoverer. This is true in all communities and in every walk of life. Now it is a fact which the essayist probably left out un-

intentionally that the scientific method is very young; that it is of only a few years' existence. Probably within the memory of many in this room there was a time when there was no scientific method. All was empiricism. All we know of the theoretical methods is founded on a few observations spoken of in the paper. As the civilization of the world has advanced we have the scientific method not only in dentistry, but in other professions, and it has revolutionized the history of the different professions. There is a school here in Boston which teaches a universal knowledge of law, and within the past twenty-five years or less it has revolutionized the teaching of law. I cannot go into the details of their method, but simply offer it as an illustration. I think the Harvard Law School was the first to teach by this method and there have been many others who have imitated this advance in law schools. I speak of this only as an illustration. No force can be exerted to stem the movement of this scientific method which has been made a force in the world in the last few years, which has worked a revolution in all sciences, and we should not be surprised that our calling should be availing itself of the opportunities the same as are other callings.

One illustration which the essayist used I did not think was so beautiful; that is, he says the boards in several states are not considerate of the work of scientific men, and are not concerned in the scientific method in education. Probably the first question which the state boards consider in licensing a man to practice is, Can he do the work in such a way that the people will be safe in his hands? In such a case skill is the first consideration, theory the second.

With regard to the second illustration, which was along the line of the old theory of approximal pressure causing decay of the teeth, it was all true that he said, but I do not think it was as full a statement of the case as could be made. I hazard the assertion that if Black, Williams, Miller, and a score of others who by their work have contributed so

much to advance our knowledge today had lived at the time of the theory which the essayist says was based on observations, it would not have been possible for them to draw any other conclusions than those drawn by our forefathers. Had it not been for the work and investigations of our noble Pasteur, whose investigations were the foundation of modern science, where would Miller and his *confrères* be today, except in the same position and obliged to draw the same conclusions as were drawn by our fathers who knew nothing of bacteriology. It was the work of this man that revolutionized the practice of surgery, and gave Miller and his *confrères* the foundations for further search along these lines. So, while we all agree in the position that the essayist takes, we must consider the means of advancement of the present day and those in which our fathers lived.

There is another thought, and that is that some of the investigations of the so-called scientific men, and some of the positive statements made, seem to conflict with clinical experience. Now, a man of my age has great respect for clinical experience, the same as the physician has for his long clinical experience. Only this morning I had an example, in the mouth of a young lady patient, of a small cavity on the buccal surface of a lower left molar. What did I do? I immediately turned my mirror to the right side, expecting to find the same condition on the buccal surface of the right molar; and it was there. A day or two ago, after filling three cavities, two bicuspid and a molar, on the left side of a young patient's mouth, fifteen years of age, while there was on the right side no evidence of decay, I deliberately put in a piece of tape to wedge the teeth apart and found just what I expected. Now, that is clinical experience. We know that the molar on the right side and the molar on the left side are formed simultaneously, with the same conditions existing when they are formed, the same environments—so much so that they seem to be twins; they are therefore subject to the same con-

ditions that bring about the decay. That is clinical experience, and you all know it is true. Why is it that these two cavities, formed on these two teeth at the same time, were affected by bacterial influence at the same time? It seems as though, if bacteria were the sole cause, it would be different. That experience as brought out in the two illustrations explains to a great extent the skepticism of the practical men in regard to the dictum of the scientific men. This is not sound reasoning, and I do not present it as sound reasoning; I present it simply as one of the reasons for the antagonistic views of the practical men, and for the lack of that respect which Dr. Kirk says they should have for the scientific men. Clinical experience is not always in harmony with the dictum of the men of scientific research.

I wish to say in conclusion that if my remarks have been considered as depreciating the value of scientific research, that is not my intention at all. I have demonstrated my belief in the method of education which I am giving to my son. He is following the modern methods of education, and I am giving him all the opportunity to learn all he will of the scientific methods in dentistry. That is sufficient evidence of my confidence in the methods of education for the men who are going to practice the dentistry of the future. I may say also that I have the happy faculty of looking on the bright side. These old men are dying out—your practical men—and the young men are fast taking their places. There are only a few, comparatively speaking, who are practicing dentistry now who were registered in 1887. The majority of the present practitioners are the men who have passed examinations for license, and these are the men who will practice dentistry in the future, and these are the men who will read this paper and approve of it. I believe the time will soon come when such appeals for the scientific method which our friend has just made will not be needed by the practitioners of the dental profession.

Dr. G. A. MAXFIELD, Holyoke, Mass.

I enjoyed the paper very much, and also the discussion of our friend Dr. Shepard, though he looked at the paper from a different point of view from mine. It does not seem that Dr. Shepard realized the position Dr. Kirk took in his paper, and he did not seem to realize that Dr. Kirk was making an appeal to the great number of men who are coming into the profession with low ideals, and that he is endeavoring to raise these ideals and place them on a scientific basis. No other class of men can realize more than the members of the examining boards what low ideals fully seventy-five per cent. of the men who are now entering the profession have. The main ideal seems to be money, and the easiest way of making a living. I want to illustrate this by just one incident in the last examination held in this city by the board last June. At the examination one young man was given an approximal cavity in a bicuspid tooth to fill with gold. After working from ten in the morning until three in the afternoon he gave the operation up. I went to him and asked him what was the matter. "Well," he says, "this is the first time I ever attempted to fill a cavity in a bicuspid tooth with gold." I said to him, "You tell me that you have spent three years in college and never attempted that before?" I asked him why he had never attempted it. He said, "They would not allow us to do it. They would not allow us to put gold fillings except in anterior teeth." I told him the trouble was with him, that all the time he was in college he was looking for the easiest things. I said, "You have been looking for the easy things with the one idea of getting through college and getting a diploma, but now you have found something that is difficult and you cannot master it." His ideals were low. I cannot take the optimistic view that Dr. Shepard has with regard to the future of the profession. I believe in setting our standard as high as we can, and I do want these young men stimulated to take higher ideals before starting in the profession of dentistry. Within the last few years I have

had men come to me and ask about the best methods of entering the dental profession, and a great many of them think that it is too hard that they should be compelled to spend three or four years in college before accomplishing anything. Many of us come in contact with a great many of these men with low ideals, and we begin to realize what the public must suffer. The only remedy I can see for this is in the strengthening of the state laws in regard to this matter, and that will tend to bring this up to the standard it should be. A great many are inclined to blame the dental colleges. I want to say that I do not believe there are any dental colleges in this country so poor but that the young men coming from them will, if they have taken advantage of all the opportunities given, make practical and scientific dentists.

Dr. W. I. BRIGHAM, South Framingham, Mass. One thought comes to my mind, and that is that many of the things that are brought forward as scientific in this day, if we will look at them in a broad light, are found to be things that were advocated years ago. For instance, in the matter of "extension for prevention" which is spoken of so much now; that was taught years ago in the schools. If one will only read Dr. Webb's "Notes on Operative Dentistry" he will find the same things advocated.

Now, Dr. Maxfield says that in the schools the students are wont to do things in the easiest manner possible. That is more or less the case with the older men of the profession. A great many knew, or rather thought, that the practice of extension for prevention was good practice, but as it requires more time and work to practice it, they did not do it until they saw it was imperative that they should.

I have one comment to make in this connection with regard to the manner of placing new appliances on the market. There are many appliances placed on the market by the so-called scientific men, and they are advocated for all conditions, and the young men take hold of them, some finding them valuable while others

find them of no value whatever. In the matter of regulating teeth there are some appliances placed on the market that are recommended for all conditions of irregularity. They may be adapted to the many conditions by men of experience and by those who understand the theories. I have often said that no man should attempt to correct irregularities until he has practiced dentistry for five years. One should not attempt this work until he has been in practice long enough to have become expert in the handling of patients and to be able to handle them carefully. Take a young man who is inexperienced in this work. He places an appliance—which is advertised to correct all conditions of irregularity—on the teeth; it will probably stay for a week or so, and then the teeth will become sore and the appliance come off. The patient comes back discouraged, the operator discouraged, and often such a patient will go through life without having those teeth regulated, simply because of the inexperience of the operator. On the other hand, if he were of a mechanical turn of mind he might devise a means of applying this appliance by which it would work more easily and more satisfactorily. The scientific side of these questions has its place and the practical side has its place, and the two should work in harmony.

Dr. C. W. STRANG, Bridgeport, Conn. I feel that up to this very present moment that suggestions which have come from the practical men (men who did not possess very much of the scientific knowledge) have been of a great deal of value to me. I remember on one occasion a suggestion that was given to me in regard to the adjustment of a simple rubber tubing and bar for the correction of an irregularity. The suggestion came from a man who, as I understood, was so illiterate that in his own office he had to employ a secretary to keep his accounts. On one occasion that suggestion was worth so much to me that perhaps it would be interesting for me to relate it. A patient came into my hands who had been treated in the city of New York for an irregularity of a central in-

cisor. The case had been under treatment for two years and was abandoned with this declaration, "It is a practical impossibility." The suggestion that was offered at the meeting of the Connecticut Valley Association was put into practical use at that time, and I corrected the irregularity in just seven days.

I am heartily in favor of the best education, and the best scientific education, that a dental student can receive from the schools. I am heartily in favor of it, because I feel that I am so handicapped myself because of the lack of it, that—as has Dr. Shepard with his boy—I have given my boy the best opportunity that the schools can offer. But the schools cannot do it all; a great deal of his success depends on the man himself. The schools can help to make the man, but if we don't give the schools the material they cannot make successful practitioners.

There is one thing in our profession which is unfortunate—that in the majority of cases the money question comes into account. It is something that attaches itself to everyone who is obliged to work for a living. We must get to the place where we are willing to work, even though we feel that we are not going to receive a financial equivalent for the services rendered. There is always room at the top, and the man who is making the most of himself and of his profession—not the man who is getting careless and trying to find the easiest way out of difficulties without trying to surmount them, but the man who is working for the interests of not only himself but his fellow man—he is making the best show in his profession, and is the man we will look up to, respect, and honor.

There are so many good suggestions in the paper that I felt while it was being read that I would like to have an opportunity to read it over and study it carefully, and I felt like congratulating the essayist when he had finished reading the paper. I thank you for the kind attention given to my few remarks.

Dr. A. J. FLANAGAN, Springfield, Mass. As I understand the paper it is simply a plea for a better understand-

ing of the scientific. If anyone understands the English language and anything in the line of drawing deductions, he cannot but appreciate the plea Dr. Kirk has made. I was interested in one remark by one of the gentlemen that discussed the paper. Dr. Shepard remarked that he had a patient with a cavity in a tooth on one side of the mouth, and he naturally expected to find a similar condition on the other side. And in this connection Dr. Shepard made a plea for clinical experience. Now, I would ask, Why did he expect to find a similar condition on the other side of that mouth—what led him to a conclusion of that kind? If I understand the situation rightly, the scientific method is a study of the phenomena such as spoken of by Dr. Shepard, observations of the phenomena accompanying and causing decay, the correlation of the facts, and making deductions therefrom. There are men living who never get beyond these observations. They live on in the same groove and are never able to make any deductions from the study of these observations because they have not the ability or perhaps the time. It is simply a matter of the personal equation. What is in a man will come out sooner or later. It is not everybody that is blessed with a scientific turn of mind, but when we find such persons in our profession it behooves us to support them. They are serving its best interests, and they see and understand some things that we do not see.

Some time ago, in the city of Philadelphia, there was formed a society for the investigation of certain psychological facts. They found a man who saw things that other people didn't, and some people immediately said he was insane, and wanted to put him in an insane asylum. This society took up the case and began studying it. It was not long before they came to the conclusion that the so-called insane man had a peculiar condition of the eyes which made certain objects appear in a very abnormal relationship. He was placed in the hands of an eye specialist, and very soon made a normal being. The question I

would ask is, Which was the practical and which the scientific in this case? How can you have practical results without the scientific? Is not science the gathering of observations and facts, and deductions from the same? No calling or profession can exist without the scientific men, and we need to support them. They are with us; let us not chase them away!

Dr. D. M. CLAPP, Boston, Mass. As I view the situation, there can be no conflict possible between science and practice—it is absolutely impossible. The sooner we can bring our profession to understand the value of scientific methods and have practice thoroughly scientific, the greater will be our success.

Dr. E. C. KIRK, Philadelphia. I want to express my gratification at the discussion brought out by the paper, and I want also to express my thanks to those taking part in the discussion. I did not mean to impress the idea that the examining boards, as educational bodies, in the performance of their educational function were propagating a wrong idea of science. But is not this having something to do with the standards? Being in position to speak authoritatively, the examining boards together with the teaching bodies are contributing to this great misconception of the scientific method by the use of such expressions as "He knows his theory all right, but he is not practical," "He is a theoretical but not a practical man." There can be no such difference as that. Dr. Clapp stated the situation very clearly when he said that there can be no conflict possible between the scientific method and correct practice. The plea I am making is for the *practicality of the scientific method*. That very thing that Dr. Strang spoke of—that suggestion which he got from a so-called practical man, and used by him—it was simply the practical application of a truth. I do not care how you get it or who you get it from; it is scientific if it represents the truth. That suggestion was a correctly observed phenomenon, and it was practical because it was a truth.

The scientific method is simply a method of reasoning, a method of observing, a method of thinking about certain things. It is just an organized way of doing things; that is the correct conception of it. The most practical man in the world is the individual who knows the most about his business. The man who does not see the value and importance of reasoning out the causes of phenomena in his work and making accurate deductions from them, and using those deductions in a rational way, is not practical—it matters not whether he masquerades as a "scientific" or a "practical" man. In the illustration of Dr. Shepard with regard to clinical experience, of course science includes clinical experience. Clinical experience is merely the result of the observation of phenomena, and the scientific method in dentistry is largely a methodical observation of these same phenomena and making correct deductions therefrom. He knows that when he finds a cavity on the buccal surface of that molar he is likely to find a corresponding cavity on the other side. His clinical experience taught him that. He says, however, that science contends that bacteria are the sole cause of this decay. Now, when we take the question broadly, in the illustration which he gave, science has no right to say that bacteria are the sole cause of that decay. They are the active cause of the decay, but there are various contributory factors—namely, the circulation, the environments, the condition of the tooth-structure. These questions I laid down in my paper as a part of the scientific method. Now, taking up the practical aspect of the case, study everything bearing upon this cause of decay, and make your deductions correctly as to what produced this decay, and you have the scientific method; that is the point I am trying to bring out.

Dr. Shepard states that the first question considered by the state boards in examining a candidate for license is, "Can he do his work in such a way that the people will be safe in his hands?" and that in such a case skill is the first consideration, theory the second. Why

make such a distinction? The practitioner to be a safe practitioner must have knowledge as well as skill, and for my own part I should unhesitatingly place knowledge ahead of skill as a guarantee of public safety—so far as the practice of dentistry is concerned.

Dr. Shepard referred to the time when all was empiricism. It was that empirical age, that period of doubt, that has given us the phenomena from which to make scientific deductions. And now we have come to where we can reason out these facts that the fathers of dentistry adduced for us out of their experience. My paper is an appeal that we may progress more rapidly than did our ancestors, by reason of the possession of these facts they have given us; an appeal for the application of our reasoning faculties in order that we may get at the truth more readily than they did. Do not let us make any mistake regarding the practical and the scientific man. If a man be not practical he is not scientific, and if he be not a scientific man he is not a practical man.

On motion Dr. Kirk's paper was passed.

Dr. Dowsley named the following gentlemen as the committee to further the financial interests of the Fourth International Dental Congress: Drs. Andrew J. Flanagan, Springfield, Mass.; George E. Savage, Worcester, Mass.; Thomas Mound, Rutland, Vt.; Henry McManus, Hartford, Conn.; and George A. Maxfield, Holyoke, Mass.

Dr. C. H. TOZIER, Boston, Mass., then read the following paper:

A NEW METHOD FOR TREATING PYORRHEA ALVEOLARIS.

As to the cause of this disease I do not propose to enter into any lengthy discussion about it, but simply make a brief summary of facts. There have been many good theories advanced and about as many exploded. I have no theory to advance and none to explode, but wish only to give you the results of a few practical observations that I have made in a large number of cases, both at the hospital and in private practice.

In the first place: Is the disease a local one or a manifestation of some general pathological process? As a general cause, and believed by some to be the principal one, we have the gouty or uric acid diathesis. In between four hundred and five hundred cases examined by me—all of whom gave a history of this trouble—in only about thirty per cent. were there signs of pyorrhea present, and when you consider that these people were hospital patients, in whom unhygienic conditions of the mouth generally prevail, it is a question if this thirty per cent. does not very much overstate the facts. In cases of acute rheumatism or gout, why do not the gums show signs of some increased irritation instead of remaining in the same condition as previous to the attack? And lastly, if we treat the disease locally and leave out the constitutional origin altogether, why do the conditions improve under this treatment and not improve perceptibly under general treatment?

"Uric acid or gouty diathesis" is a first-class term, but even in medicine we do not know what it means, and apply it to almost any general symptoms for which we cannot find any sufficient cause. The dental profession has followed the medical and has also made use of the term to help to get over many difficulties.

Another party claims that pyorrhea is present only in those with diabetic or albuminuric tendencies, but there are many people—and I think they are in the majority—that are troubled with pyorrhea, and that have neither diabetes nor Bright's disease to account for their condition. Nor does it seem that persons having either of these two diseases are prone to the attacks of pyorrhea. Out of forty-seven cases examined, in only six were symptoms of this disease of the gums found to be present.

Dr. Ingersoll claims that sanguinary calculus is the cause of pyorrhea. The lime salts being deposited on the surfaces of the roots produce an irritation, but he fails to prove that these salts do not come from the saliva as well as from the blood.

or that other conditions do not enter, as well as the calculi, into the cause of the disease. Other claims have been brought forward by different observers from time to time, one claiming that the disease begins in the roots, another at the gingival margin, still another that it is in the peridental membrane, then a fourth comes forward and says, You are all wrong, claiming that it is due to a molecular necrosis of the alveoli. Nevertheless, leaving different theories out of the question, I think the majority of recent observers seem to favor the local origin of the disease.

From my experience the following facts have been noted in nearly all cases. In the first place, some local irritation seems to be present, the exact character of which I think it is almost impossible to determine. This irritation may be calculi of one kind or another, decomposing food, mechanical, chemical, or thermal processes, present either naturally or artificially, and lastly bacteria. This latter agent, bacteria, I think has as much to do with causing the trouble as all of the rest combined. As you know, there are some twenty odd species that regularly inhabit the mouth. It would be very hard to tell which one or which ones are responsible for the trouble, inasmuch as Koch's postulates could not be readily carried out, because the lower animals are not very susceptible to the disease, and even if they were it would be impossible to keep their mouths sterile while the experiments were being carried on. I think you can all see what a first-class breeding-place there is just under the gum margin, and here bacteria could remain under ordinary conditions for a long time without being disturbed. Particles of food lodging in these spaces and decomposing would help matters along, as well as the presence of tartar, which irritates the gums, thus giving the germs a good chance to infect the surrounding tissue and produce pathological changes. This, perhaps combined with a lowered tone of the general bodily health, would give every chance for the disease to progress, and finally a destruction of the alveolar process results. The extension

of the disease to the jaw-bone itself is probably prevented by the periosteum covering the bone, and the natural resistance of the tissues. The sponginess of the alveolar process, with the many openings into it, naturally makes it an easy prey to disease.

Besides this, we have the cavities of the nose and throat, which are in themselves great breeding-places for bacteria. In this climate, especially, we are very subject to catarrhal affections of one kind or another which more or less lower the tone of the mucous membrane and adjacent structures in the mouth. And in both nose and throat there are often found pathological changes which are similar to those found in pyorrhea. In atrophic rhinitis and pharyngitis there is always more or less of a discharge of pus with an atrophy of the mucous membrane and adjacent tissues, which may finally lead in the nasal cavity to a complete absorption of the turbinate bones, which are similar in structure to the alveolar processes. If you should carefully examine the cases of pyorrhea, you would find in most of the patients some trouble with the nose or throat, and a great many times atrophic changes are present. In fact I have found, especially in the well-marked cases, that it is absolutely necessary to keep the nasal and throat passages as clean as possible in order to treat successfully the pyorrhea present in the mouth. In every case I carefully treat the nose and throat as well as the gums if I wish to help the latter. This is where I think many dentists fail in their treatment; they take the mouth only into consideration, and treat that, not thinking that there may be, and probably is, a constant supply of irritative or infectious material poured into the oral cavity from the nose and throat.

In some cases you will find diseased tonsils. They should be promptly removed, as they are a constant source of infection. In young people adenoids may also be present, and if they produce any symptoms whatever they should also be operated upon. In rare cases deviations of the nasal septum, and large spurs

or ridges upon the same, may produce more or less of a local irritation; if so, this trouble should be remedied by an operation and the nasal passages opened up.

In summing this all up I wish only to point out that the results of my observations seem to show that the principal cause of pyorrhea alveolaris is probably one or more organisms which gain entrance into an irritated and depressed tissue, and there produce pathological changes. This irritation may be due to calculi of different kinds, decomposing food, mechanical, chemical, or thermal irritants, or gouty, diabetic, or albuminuric conditions; and also the condition of the nose and throat may have a great deal to do with diseases of the mouth, and especially the one under consideration.

Treatment. Here I shall classify the various cases of pyorrhea all under one head, and consider that the treatment in one case answers with more or less modification for all.

In the first place all irritants, of whatever kind or nature, must be removed as far as possible. The mechanical, chemical, and thermal irritants are generally easy to eliminate. If gout, rheumatism, diabetes, or albuminuria be present, they should be treated systemically by a competent physician, and his results reported to you from time to time in order that you may judge whether the increase or decrease of these general conditions affects the local processes going on in the mouth. It is only by this method that we can be able to judge how much of the process is due to local causes and how much to general affections such as those mentioned.

If there be an acid condition of the mouth, counteract this by means of any good alkaline mouth-wash, used as often as necessary. This will neutralize the lactic or any other acids supposed to be present. Carbonate of lithia internally will also help you out to a great extent.

We come now to the local treatment of this complex condition, which is probably due primarily to some sort of irritation followed secondarily by an infection.

The first thing to do, in all cases, is to put the teeth in as first-class a condition as possible. All roots and badly broken-down teeth which cannot be put in good condition should be extracted, also all teeth that are so loose that their condition is hopeless from the start. If there be a great strain on one or more teeth that are moderately loose, this should be relieved in some way, either by grinding them down or fitting a plate, or by some other method which will accomplish the purpose.

In case several of the teeth in a row are quite loose, some sort of a splint should be used. The molars and bicuspids when thus affected can be fastened together by means of a bar running in a groove from one crown to another, and anchored by a gold filling. In the case of the anterior teeth, incisors, and canines, swaged metallic caps of gold can be made and cemented to the teeth. I do not advise the use of wire, or especially of floss silk wound around the necks of the teeth, as it prevents you from treating them properly, and also it is very hard for the patient to keep it clean. With the partial cap the gum margin is not at all interfered with, and they are much easier to keep in a cleanly condition.

The next, and one of the most important things, is to clean the teeth as thoroughly as possible, scraping each until it is smooth and free from foreign matter. There is one point in cleaning which I wish to bring out here. Probably nearly all of you remove the tartar either with a down push or an up pull. Now, did you ever stop to think that with either stroke of your instrument, and more especially by pushing it downward, you drive more or less of the tartar and other foreign matter into the lacerated gums, where it serves as a nucleus for new calcium salts to be deposited upon? In some cases it is a question whether you have not done about as much harm as you have good in distributing the tartar and infectious materials so thoroughly into the surrounding tissues. In all cases of pyorrhea I remove the larger particles of tartar by any of the approved methods, but am very careful not

to work beneath the gum margin with the instrument; after this preliminary step I use the compressed-air outfit and by means of from forty to seventy pounds pressure force the gums as far as possible away from the teeth, then work down under them and remove the balance of the calculi. This blast of air serves three great purposes: (1) Drives the gums a greater or lesser distance from around the tooth and thus enables you to get a clearer vision, and better field to work in. (2) It blows away the blood and saliva from the field of operation. (3) Removes the pieces of calculi as fast as you cut them off, thus keeping them from being pushed to any extent into the surrounding tissues, or from lacerating the gums. The removal of the blood and saliva you will find to be a great help, as you are then better able to remove nearly every particle of the calculi and to smooth the teeth up most thoroughly.

We come now to my special treatment of these cases. For this I use an air-tank capable of standing one hundred pounds pressure to the square inch. In size it can be anywhere from ten gallons to forty gallons capacity; the larger the tank the easier it is to keep the pressure up. To supply the air I use a Victor compressed-air pump of $\frac{1}{2}$ -horse-power, which runs by electricity. You also want about half a dozen of McElroy's spray tubes of various shapes and plenty of tubing to conduct the air. This spray, which is finely divided and driven with much force, I think you will find very much superior to any of the older methods of applying solutions. The stream from the hard syringe is too coarse and clumsy. There is little or no penetration produced by simply laying on the gums pieces of medicated cotton, and if you tuck it under them you simply push more or less of the infectious material farther up into the pockets around the teeth, thus increasing rather than decreasing the trouble. With this spray you have an agent capable of penetrating the finest spaces and of carrying a large amount of solution to them. It also massages the gums and cleanses the surrounding tissues up most thoroughly.

It is not in the least painful to the patient when properly handled, and the number and kind of solutions can be varied at will. A tongue-depressor is absolutely necessary, together with throat and mouth-mirrors and a nasal speculum. As I have found it much easier to work by reflected light in a dark room than by daylight, I use a 3-inch head-mirror of about 15-inch focus, and a 32-candle-power incandescent electric light confined in a reflector. By this method I can examine the nose and throat as well as the mouth, and if there is any trouble in these accessory cavities, I can treat them at the same time with the pyorrhea.

Everything being ready, the patient is seated before you, and carefully covered up with a rubber apron and plenty of towels. The mouth is lighted up by means of the head-mirror, and the tongue and cheeks held out of the way with the tongue-depressor. Several precautions are necessary while working with the high pressure: Be careful not to choke the patient by spraying directly into the throat; do not let the tube slip and fill the patient's eyes with the liquid, nor cause the nose to bleed by striking the nasal mucous membrane. If there be any serious ear trouble present do not give the treatment, and at all times be careful not to condense the air in the oral cavity unless the mouth be wide open, because, should you do so, you are liable to rupture the ear-drum from the air rushing up through the Eustachian tubes. If you do this your patient is probably lost to you forever, and perhaps more or less of your reputation. If the teeth be extra-sensitive, use a low pressure at first until they become accustomed to it. In some cases a saturated solution of zinc chlorid, applied locally, will relieve them.

The operator must also be protected, especially in bad cases, as more or less of the infective material is blown out of the mirror into your face. Glasses and the head-mirror are first-class protectors, and a face mask may be necessary. After each treatment you should carefully wash your face and hands in some antiseptic

solution, as, if you do not do so, you will find a most beautiful crop of pimples, and perhaps boils, breaking out on your face.

For the first solution I use a wash composed of one-quarter hydrogen dioxid and three-quarters hot water. Every one of the solutions you use should be hot, as a cold solution combined with the air makes the treatment very painful in some cases. When you first begin, use a pressure of only thirty to forty pounds, and see if the patient can stand it. If so, you can run it up gradually to one hundred pounds, as the more the pressure the better the results of the treatment. The first tube may make the gums bleed quite freely, but you will find this will stop as you go on, especially under the astringents that follow. The dioxid removes all decomposed matter that may be present, stops the hemorrhage, and I think also stimulates the tissues by giving up its oxygen to them. Pus, especially, is very susceptible to it, the dioxid removing it probably better than any other agent.

After the dioxid, the next solution used is composed of tincture of myrrh one-half dram, shaken up in the tube full of hot water. This, you know, acts as a stimulant to the circulation in the mucous membrane, and at the same time is slightly astringent. Its taste can be overcome by the addition of a small amount of saccharin.

Following the myrrh I use a strong solution of tannic acid in water and glycerin, flavored with oil of wintergreen and sweetened with saccharin. This acid, when brought in contact with the mucous membrane, constricts it and decreases its vascularity for a time, by causing contraction of its blood-vessels. For this reason it stops secretion and condenses the parts which are relaxed and feeble, thereby toughening the membrane. I also give all the patients a mouth-wash, with this astringent as a base, to use at home twice a day; after which brush the teeth, and rinse the mouth out with warm water.

After allowing the tannic acid solution to soak in for five to ten minutes, I

spray in an alkaline solution, made from a powder composed of equal parts of sodium bicarbonate, sodium borate, and sodium chlorid. About one-half dram of this mixture to the spray tube of water is used. This counteracts the acidity of the former solution, and removes the strong astringent feeling present in the mouth. This alkaline solution can be mixed with a solution of listerine or any other pleasant antiseptic solution which is agreeable to the patient.

As a final spray, I use an oily solution which is composed of benzoinol in which is dissolved a small amount of camphor, oil of eucalyptus, and menthol. This is also a strong antiseptic, which fills and coats over all of the pockets around the teeth. As it is only very slightly soluble in saliva, these strong and stimulating antiseptics are kept in contact with the gums for a long time, and the benefit of your treatment extended for a greater period than is otherwise possible. It is also a ready method of partially sterilizing the nose and throat if they be sprayed with this solution.

The number of treatments for any one case depends upon the severity of the disease. Generally from six to twelve are sufficient to reduce the inflammation, harden the gums, and tighten the teeth to a greater or less extent. I have the patient come twice a week until these results are obtained.

After I have obtained as satisfactory results as possible I request the patient to return in one month, in order to see if the benefit produced by the treatment is lasting, and if the gums have held their own, being pink and healthy-looking. If I find the gums looking healthy, hard and firm, and with no exudation from the sockets, I give them a thorough treatment, tell the patient to use the astringent wash twice a day at home, and return again in three months. If at the end of this time the gums are somewhat swollen and red, I search for some irritative substance under the gums—and you can generally find one—remove it and with a treatment you will find this inflammation will promptly disappear.

In conclusion I wish to say that if this treatment be faithfully carried out by both doctor and patient, I believe the results obtained will be surprising to you, and of great benefit to the patient. I have treated a large number of cases by this method, and in all of them great improvement has been made and the mouth put into a more cleanly and comfortable condition. I do not under any consideration claim this to be a cure, and wish you to thoroughly understand it in this way. It has kept many patients' mouths in good condition for a period of two years without the disease making any appreciable progress. Further than this I cannot make any definite statement, as I have only used the treatment during that time. Probably some of you will be tempted to try this method for treating pyorrhea and perhaps not obtain as good results as you wish, or as I have held out to you in this paper. Do not be discouraged if things do not respond promptly, or say that the treatment is a failure. I have been working upon it for two years, and it is by no means perfected yet. One of you may stumble upon a solution that will produce better results than anything I have tried, but as far as the principle is concerned I think it the correct one.

Of course you as dentists are handicapped to some extent, as the diseases of the nose and throat will bother you, but in case of trouble send them to a specialist who can give you a report upon the conditions present and treat them if necessary. For an excess of uric acid, diabetes, or albuminuria, the family physician can send you a statement in regard to them and also other general bodily conditions, and you can govern yourself accordingly. The more I see of cases, the more I believe that the dental student should have at least one year of general medical education, special attention being paid to diseases of the nose and throat and accessory sinuses. This sinus trouble alone will keep up a bad case of pyorrhea and discourage you and your patient if you do not find the exciting cause, viz, pus flowing more or

less into the oral cavity and infecting the gums as fast as you can clean them out.

On Friday I will give a clinic showing you how to work the compressed-air apparatus, and treat patients that have pyorrhea. I will also be glad to give you more detail in regard to the apparatus and finer points in the treatment. Kindly do not do as several well-educated dentists did at the last meeting of the Massachusetts Dental Society; they asked me to cure a patient while they were watching me in the clinic, or they could not believe my statements. Neither, because I do not have a patient with his teeth nearly ready to fall out, and do not fasten them in as good as new in less than five minutes, immediately say that my treatment is a failure. I know that it is a new venture, and, as in all new things, many flaws can be found in it, but as I said, I think we are on the right track to cure or alleviate this troublesome disease, which produces more destruction in the human mouth than all the rest of the diseases combined. Any suggestions or improvements that you can make upon this treatment I would be very glad to have, as it will help me greatly in my future work.

Thanking you for your kind attention, and hoping that I have not tired or bored you with this long paper, I will now close, and on Friday you can see the treatment in operation.

Discussion.

Dr. A. H. SPICER, Westerly, R. I. I would like to ask if the doctor has ever had anyone die under this treatment?

Dr. TOZIER. I am glad to say that I have not. Of course in this method of treatment we are working under high pressure, and we have to be very careful. By just a little experience we may all be able to get good results. I would advise the use of a pressure of twenty pounds to begin with, and increase this as fast as possible. The higher the pressure you use the better will be the results. I have not been able to find a tank that would stand a pressure of more than two hundred pounds. My ex-

perience is that the higher the pressure the more thoroughly we can clean out the sockets. Of course you have to be very careful about the nose and eyes of the patient, and also to have the mouth kept open while using the spray.

Dr. W. I. BRIGHAM, South Framingham, Mass. This paper has a practical side. I do not doubt that the doctor gets good results, but good results can be obtained in an easier way. If we will follow the methods used by Drs. Smith and Taylor, and practice what they preach we will be able to get excellent results. The essayist says that the first thing indicated is to thoroughly clean all the particles from the teeth. When that is done we have the case well in hand. With regard to removing deposits from the roots of the teeth, it can be done in several ways, but it is not merely the removal of the deposits, but it has to be followed by a thorough polishing of the tooth. It is like cleaning the rust from a piece of steel; you can scrape it off, but you never have a good condition there until you have thoroughly polished it. I have had case after case of pyorrhea, and I have been surprised at the good results to be obtained by the simple prophylactic method advocated by Drs. Taylor and Smith. We all have learned by experience that the mere application of drugs will not effect a cure in this disease, but it has to be done by scraping and polishing.

Dr. G. A. MAXFIELD, Holyoke, Mass. I have been very much impressed by

this presentation of the subject. I never before heard the theory advanced that catarrhal affections of the nose and throat induced pyorrhea. The idea never came to my mind before, and while we know that many affections have caused pyorrhea, I think the theory he has advanced is a very plausible one, and we have good reasons to follow out the lines indicated. With my apparatus I have not been able to get a higher pressure than thirty pounds, and my difficulty has been to get rubber tubing to stand even that pressure. I will say for this method that since I have introduced it into my practice my treatment of pyorrhea has been more successful than before. I believe that Dr. Smith's method of prophylaxis is good in this treatment, and I am sure that if we will go a step farther, by introducing remedies by the compressed-air method, the results will be more beneficial.

Dr TOZIER (closing the discussion). I have nothing special to add to what has already been said in the paper. I simply want the members to understand that I do not claim this treatment to be an absolute cure. I have only been using it for two years, and very satisfactory results have been obtained in from five to six hundred cases, but how long this will last I cannot say, as the time mentioned is too limited to draw definite conclusions.

On motion Dr. Tozier's paper was passed.

(To be continued.)

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EDITORIAL DEPARTMENT.

THE RECIPROCITY CLAUSE IN THE DENTAL ACT OF THE DISTRICT OF COLUMBIA.

THE following amendment to the dental law of the District of Columbia, after passing both houses of Congress, was approved by the President on February 5, 1904:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

That the Act of Congress entitled "An Act for the regulation of the practice of dentistry in the District of Columbia, and for the protection of the people from empiricism in relation thereto," approved June sixth, eighteen hundred and ninety-two, be, and the same is hereby, amended by striking out all of the proviso in section three of said Act and inserting in lieu thereof the following: "*Provided*, That the board of dental examiners may issue a license to practice to any dentist who shall have been in legal practice for a period of five years or more, upon the certificate of the board of dental examiners of the State or Territory in which he practiced, certifying his competency and moral character, and upon the payment of the certification fee, without examination as to his qualifications."

It will be seen that the act relates specifically to the regulation of the practice of dentistry within the District of Columbia, and further that the reciprocity provision is apparently not mandatory but discretionary with the Board of Dental Examiners.

As far as it goes we regard the amendment as a wise and useful measure, and it is perhaps doubtful if in the present state of professional and

public opinion a broader measure could have been enacted. Our criticism upon it would be that as an effective instrument to secure practical reciprocity it should have been provided that any applicant for license to practice dentistry in the District of Columbia who has already received a license from the board of dental examiners of any state or territory which maintains a standard of qualification fully equal to that required for license to practice in the District of Columbia should be entitled, upon certified proof of the facts in the premises, to a license without further examination. The reciprocity feature should be made unequivocally mandatory upon equal qualification, and not discretionary with the board.

In any case in which wide discretionary powers are accorded to a board by statute while at the same time no provision is made in the law for public record of the standards maintained nor of the tests to which the candidate is required to submit, the door is opened for favoritism and injustice, which sooner or later is bound to crop out, especially under the usual system of appointment of board officers. It is, however, quite probable that the permissive form of the amendment would be mandatory in its effect in any case where a candidate for registration under the reciprocity clause could demonstrate that he had fulfilled the specified requirements. That is to say, the board of examiners could not at their discretion withhold license from any applicant who had fulfilled the requirements under which reciprocity is provided for by the amendment. We believe that would be the view of the courts in any action brought to determine the point under consideration, but the act should be so worded as to leave no room for doubt in order to avoid misunderstandings and consequent possibilities of litigation.

This amendment to the dental law is of importance and interest in several particulars. It represents in the first place a practical effort to secure what all are agreed in regarding as desirable, viz, interchange of licenses between the several states. It is, however, defective in that it fails to establish the educational standard upon which reciprocity is to be obtained, and therefore it will in effect do just what any plan of this sort will do in which the standard of qualification is disregarded, *i.e.* level the basis of interchange downward rather than upward.

There is another aspect of this question to which attention should be called—and reference is here made to the matter because the publicity which has been given to this amendment through the daily press of the country has in numerous instances created erroneous ideas in regard to its scope. The reciprocity clause is not national in its application, as it has been stated and misunderstood to be. It is purely local in its effect and without any bearing whatsoever upon the dental laws of other states. This amendment and the statute to which it relates was enacted by the national Congress, it is true, and the national Congress also legislates within constitutional limits for the whole country, but under the federal constitution

it is without power to legislate in any way that will inhibit the police powers of the individual states. Dental legislation is an exercise of the police power, and under the constitution the national Congress cannot pass a dental law effective beyond the limits of the District of Columbia, over which territory it has jurisdiction in the same way that a state legislature is related to a state. We call attention to this fact to correct the erroneous impression entertained by some that the reciprocity amendment of the District of Columbia dental law is applicable to the whole nation.

A WELL-DESERVED HONOR.

HIS many friends will be glad to learn that at the "University Day" exercises, held February 22d, in Philadelphia, Dr. James Truman, professor of Dental Pathology, Therapeutics, and Materia Medica in the University of Pennsylvania, and editor of the *International Dental Journal*, was the recipient of the honorary degree of Doctor of Laws for distinguished services during fifty years in the work of dental education. The degree was conferred by the provost of the University, Charles C. Harrison, LL.D., at the instance of the Board of Trustees, in the presence of a large and brilliant audience.

This is but the second instance where an honorary degree in letters or science has been conferred upon a practitioner of dentistry by the University of Pennsylvania, the previous case being that of Prof. W. D. Miller of Berlin, a graduate of the University of Pennsylvania. The singular fitness of both these instances of well-earned honors well bestowed is matter for congratulation, not only to the recipients, but to the dental profession at large, because of the recognition which an ancient and honorable seat of learning has accorded to the status of the profession of dentistry as exemplified in the character and attainments of two of its recognized leaders.

CORRECTION.—In the paper by Drs. Cudworth and Eisen in our February issue, the description of Fig. 2 on page 95 should read "Labial view" instead of "Lingual view."

BIBLIOGRAPHICAL.

"ELECTROTHERAPIE DENTAIRE." DENTAL ELECTROTHERAPY. By Dr. FOVEAU DE COURMELLES. With a Preface by Dr. CH. GODON. Paris: A. Maloine, 1904.

The volume before us constitutes so far as we are aware the first exhaustive contribution to the study of electrotherapy in its relation to the treatment of dental disorders. This work, which is the outcome of the author's experience during eleven years in the field of electricity in its relation to both medicine and dentistry, contains all the data required by the dentist should he desire to avail himself of the advantages of electrical energy as an aid in the treatment of oral disorders.

The book is divided into nine chapters. Chapter I is devoted principally to the discussion of Electrolysis; Chapter II to Electrolytic Dentinal Anesthesia—and here the author describes his method of inducing local anesthesia with cocain made to penetrate the gingival mucous membrane by means of a continuous current. This procedure, based on the electrolytic transportation of ions, has been successfully employed in France through the efforts of Mons. Foulon, who gave a full account of it in the *Revue Internationale d'Odontologie* for December 1892. The method consists in the decomposition, by means of a continuous current, of a salt of cocain applied upon the gum. The base, cocain, is thus driven within the gingival tissues, producing a degree of insensibility which has been found to be sufficiently intense

and lasting to warrant the extraction of teeth under its influence. The remainder of the chapter is given up to the discussion of cataphoresis in connection with the treatment of caries of the second, third, and fourth degrees.

Chapter III embraces a consideration of the Physiology of Currents, and of the accidents that may follow their employment in cases in which the necessary precautions have not previously been carried out.

Chapter IV contains a description of Ruhmkorff's bobbin and of induction coils in general.

Chapter V treats of high-frequency currents, together with their microbicidal properties and their employment for the production of local anesthesia for minor operations. The author's experiments carried on in collaboration with Dr. Charrin are here fully reported, and show conclusively that high-frequency currents have an attenuating effect upon diphtheria toxins and upon those of other microbes of the pathogenic variety. This chapter contains an interesting account of d'Arsonval's experiments on the production of partial anesthesia by means of these currents. Under anesthesia thus produced, a number of teeth were extracted painlessly.

Chapters VI, VII, and VIII are devoted to the discussion of the X Ray, Radioscopy, and Radiography respectively, while Chapter IX is given up to a discussion of the properties of light and of the X ray in the treatment of dental and oral affections.

The author is to be congratulated upon the results of his efforts as embodied in the volume under consideration, which we trust will serve its purpose in generalizing the use of electrical energy as an aid in the treatment of diseases within the scope of dentistry. J. E.

"PATHOLOGIE DES DENTS ET DE LA BOUCHE." PATHOLOGY OF THE MOUTH AND TEETH. By Dr. LEON FREY, Ancien Interne Dentiste des Hôpitaux, and G. LEMERLE, Externe des Hôpitaux, Préparateur du Cours de Pathologie spéciale. Paris: J. B. Baillière et fils, 1903.

This work on dental pathology constitutes one of the series of nine manuals for dental students published under the editorial supervision of Professor Godon of the École Dentaire de Paris.

This, the second edition of the book, has been carefully revised and enlarged so as to embrace the results of the latest investigations on such topics as dental bacteriology, salivary chemistry, and pyorrhea alveolaris. The work is divided into two parts: Part I, which is subdivided into seven chapters, is devoted exclusively to the pathology of the

teeth; while Part II, with its ten sections, is taken up with the discussion of the nature of the diseases which affect the buccal mucous membrane and neighboring regions.

The book is a clear and explicit *exposé* of the pathology of all diseases which the dentist may be called upon to treat, and its understanding is greatly facilitated by reason of the concise style of the authors. The problem of dental caries, with its symptomatology, pathology, and treatment, is fully discussed, and will help students materially in obtaining a correct conception of the bacterio-chemical process leading to the disintegration of the tooth-tissues, as well as of the factors which favor the development of this morbid condition.

The chapters on Traumatic Lesions of the Teeth, on Affections of Arthritic Origin, and on Accidents of Dentition are equally interesting and instructive. In the chapter on Dental Abnormalities the authors have included much valuable information on the etiology of dental irregularities; and as a whole the book is one to be commended because of the accuracy of its contents.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

[*La Stomatologia*, Milan, January 1904.]

SALACREOL. (EDITORIAL.)

Salacreol is a compound resulting from the action of salicylic acid upon creasote. It is a brown, oily, almost odorless liquid, easily soluble in alcohol, ether or chloroform, but not in water; it is easily absorbed through the skin, does not stain it, and produces no irritation whatever. It is employed externally in rheumatic affections and as a gargle in inflammations of the mucous membrane of the mouth and throat.

[*Archives de Stomatologie*, Paris, December 1903.]

DIMINUTION IN THE TOXICITY OF COCAIN BY THE ADJUNCTION OF ADRENALIN. By E. FOISY.

Drs. Foisy and Bazy have been carrying on for more than a year a series of experiments on local anesthesia by the injection of cocaine and adrenalin. They have observed that the addition of adrenalin to cocaine imparts to it the following advantages: (1) Greater anesthetic power upon healthy and inflamed tis-

sues. (2) Vaso-constrictive action of greater intensity. (3) Decrease in toxic action.

The authors state that the purpose of this communication is to call attention to the observed fact that the addition of a few drops of an adrenalin solution to a solution of cocaine prevents the accidents which occasionally follow the injection of cocaine.

The investigators studied the effect of cocaine adrenalin solution upon man and upon the lower animals. The solution which they have employed was composed of 10 cc. of cocaine hydrochlorid solution 1:200 and 10 drops of adrenalin solution 1:1000. They employed this solution to produce local anesthesia in inflamed tissues in 149 patients. The doses injected varied from 2 to 10 cc. No phenomena of intoxication occurred in any of the cases thus treated. The toxic dose of cocaine hydrochlorid in animals, according to Laborde, is about one centigram per kilogram of body weight. With the cocaine adrenalin solution greater doses were injected in guinea-pigs without the production of contractions or convulsions.

[*Transactions of the Odontological Society of Great Britain*, December 1903.]

A CASE OF BILATERAL PARTIAL NECROSIS OF THE MANDIBLE. BY W. S. NOWELL.

The essayist reported a case of necrosis on both sides of the mandible due to traumatic inflammation intensified by septic infection from the neglected state of the teeth and mouth. The patient, a cabman aged sixty, suffered severe injuries as the consequence of an accident in which his cab was run into by a motor car. When brought to the Middlesex Hospital it was found that his right leg was broken above the ankle, the right forearm and back injured, and there was an extensive incised wound from above the right eye, passing down the right cheek. The jaws were jarred and bruised, but not actually fractured. Some teeth were loosened, and a right lower molar causing pain was removed. After he had recovered from his more serious injuries he was removed to a special ward by himself chiefly on account of the extreme offensiveness of his breath. The essayist saw him at that time. His gums and mucous membrane generally were intensely inflamed, the tongue was thickly coated with yellowish-brown fur, the teeth were covered with tartar, and the lower incisors were very loose. The latter were at once removed. Antiseptic washes were prescribed and the teeth were

brushed regularly. His intensely offensive breath and tightly closed jaws made a thorough examination impossible at this period.

Gradually the local condition improved, so that the teeth could be scaled and the mouth cleansed once or twice a week. It then became evident that a considerable portion of the alveoli was necrosed. A lower left molar with dead bone attached to it was removed. This was followed by a decrease in the offensiveness of the breath, and the general condition readily improved. About a month and a half later, Mr. Nowell separated the dead bone on the right side and removed it, along with a molar tooth. Considerable difficulty was found in doing this, owing to the patient's inability to open his mouth. A great improvement followed; the breath ceased to be offensive, and the patient came to look and feel well.

The author concludes his communication by stating that it may be worth while to mention that the patient attributes his dental troubles chiefly to the fact that he used to bite through thick glass bottoms or stems of tumblers for wagers.

[*l'Odontologie*, Paris, January 15, 1904.]

A CASE OF LUDWIG'S ANGINA OF DENTAL ORIGIN. BY A. SQUILLANTE, D.E.D.P., D.F.M.P.

The author has had the opportunity of observing several serious disorders of infectious character caused by unhygienic mouth-conditions. Among the many cases that came under his notice during his term at the military hospital at Algiers, the one which will be now described presents some interesting features by reason of the peculiar evolution of the disease. It was the case of a soldier, who upon his admission to the hospital presented a tumefaction on the floor of the mouth which protruded externally under the left side of the body of the jaw. Upon both sides of the jaw, roots and fragments of roots were to be found. These were immediately extracted. The tongue was tumefied and edematous, and lay against the palate and the internal surfaces of the cheeks, filling up almost completely the buccal cavity.

The hospital surgeon incised the tumefaction upon the median line. After separating the several muscular layers a wound extending to the right angle of the mandible was discovered. Provision was made for drainage, and while no pus discharged through it, some serum of decidedly objectionable odor made its escape. The incision of the phlegmon

greatly relieved the patient, as it decreased the distress previously experienced during respiration and mastication.

As the patient had not been able to drink during the previous two days, and was consequently very thirsty, he was given a glass of lemonade, which he drank so rapidly as to produce laryngeal spasm. To remedy this, rhythmical tractions of the tongue and elevation of the arms were immediately practiced, but as he did not improve tracheotomy was performed, inserting a cannula in the tracheal orifice. Thenceforth the patient breathed only through the cannula. During the following days a slight amelioration could be detected, as the sub-mental and sub-lingual swellings seemed to have diminished. Notwithstanding, however, the careful nursing and repeated washings of the mouth with hydrogen dioxid solution, the infection became more intense, tachycardia appeared, and the patient died five days after his admittance to the hospital.

The autopsy showed that the muscles forming the floor of the mouth had a very blackish coloration, and were infiltrated with serum. Nowhere could a purulent collection be found. The cellular tissue had an amyloid appearance. The left side of the trachea upon its entire length, and the cellular space separating it from the esophagus, presented evidences of septic infection. All the cellular tissue posterior and to the left of the trachea had a blackish gray and putrid appearance, giving off a very fetid odor. Upon the right side the cellular tissue looked healthy, and in the anterior mediastinum showed signs of infection.

[*l'Odontologie*, Paris, December 15, 1903.]

CONSIDERATIONS ON THE SURGICAL TREATMENT OF DENTAL IRREGULARITIES. BY P. MARTINIER, PROFESSOR OF PROSTHESIS IN THE ÉCOLE DENTAIRE OF PARIS.

The method of treating dental irregularities which consists in regulating a malposed tooth by means of an ordinary forceps or of a special one is known as "immediate regulating." It is applicable to anomalies of direction such as anteversion, retroversion, torsion, and axial rotation. The surgical method comprises three subdivisions: (1) Abrupt rotation; (2) Immediate luxation; (3) Rectilinear surgical treatment.

The first of these methods can only be applied to the treatment of rotated incisors and canines of the upper jaw; the second to the treatment of anteversion, retroversion,

and rotation of the front teeth and bicuspid, and the third is employed in that of retroversion of the incisors. The method of abrupt rotation was practiced by Fauchard; afterward numerous authors expressed opposition to its adoption, and it was only at the beginning of the last century that it was again taken up. Tomes advocated the system, recommending that the operation be performed in two sittings. Magitôt published a series of seventeen observations. This author considered this the method *par excellence*, and used regulating appliances only in cases of retroversion accompanied by other abnormalities. David was also an ardent believer in this method, although he recommended the slow and progressive reduction of the malposition, and to finish the treatment by the surgical method.

Before taking up the discussion of the advantages and disadvantages of the method under discussion, as well as the cases in which this method would be indicated, the author gives a description of the mode of operating. The most favorable age is from eight to ten years; the operation is practiced only upon single-rooted teeth, preferably the incisors. The operator should ascertain that there is sufficient room for the tooth after its rotation into normal position. The abrupt rotation should not be carried out if any other complications be present. Efforts should be made to find, so far as it may be possible, the direction of the roots, never losing sight of the fact that abnormalities of direction are usually accompanied by abnormalities in root-development. At the present time, with the assistance of the Roentgen rays, it becomes comparatively easy to ascertain the form and direction of roots. After treating antiseptically the field of operation the luxation is carried on by means of a forceps, with beaks protected by means of silk, sandpaper, lead, or rubber. Mr. Dolamore, who is a partisan of this method, has seen teeth jump out of their alveoli in the course of operation for rotation. To obviate this possibility he attaches to the beaks of the forceps a piece of rubber of appropriate size and shape, so that when applied to the tooth it will rest against the cutting edges. When the forceps are applied the pressure of the rubber against the free edge of the tooth prevents the tooth from leaving its alveolus. The tooth is firmly grasped at the neck, and is then subjected to a slow rotary movement. All lateral movement should be avoided, as it would tear the pericementum, causing the tooth to leave the alveolus. In adults, where the luxation is difficult, it is advisable to perform the

operation in two sittings at an interval of fifteen days. The pain produced by the luxation is very intense, very much like that accompanying the extraction of teeth, but can be lessened by the injection of cocaine in solution of 1:100. After the tooth has been rotated it should be held in its new position by means of a splint.

The author proceeds to discuss the advantages of this method, stating that by means of it an irregularity which would otherwise demand perhaps several months can be corrected in one or two sittings. He then quotes the advantages as enumerated by Magitôt, and says that while according to that author the method under discussion would have the preference over all others, yet if we examine conscientiously the disadvantages which it possesses it can no longer occupy the same exalted position. Some authors look upon abrupt rotation as an incomplete extraction, while others consider that in order that the operation should be productive of results the pericementum must perforce be ruptured. If such should be the case the operation becomes a replantation, the results of which are always indefinite and uncertain.

Referring to the accidents that may follow the operation of abrupt rotation, Dr. Martinier tells us that they may be divided into immediate and remote. The immediate accidents are involuntary extraction, fracture of the crown or root, fracture of the alveolar border, and the elongation of the tooth—first because of the internal configuration of the alveolus, which is no longer in relation to the shape of the root, and second, because of the reaction of the ruptured ligaments compressed at certain points. To these accidents may be added certain complications of lesser importance, such as fretting of the rotated tooth or any of its neighbors. The remote accidents are all caused by traumatism, which very often brings about the mortification of the pulp. In children the size of the apical foramen renders this complication less frequent. The author, judging from his experiences, believes that in a large majority of cases the abrupt rotation is followed by death of the pulp.

The second subdivision, namely, that of immediate luxation, consists in cutting out the osseous tissue in front of or behind the tooth—according to the direction in which it is to be moved—by means of a small circular saw mounted in the handpiece of a dental engine. This operation may be followed by accidents similar to those described in relation to the previous method.

The author is opposed to this method, as

he has never been able to find a case in which it would be indicated.

The rectilinear surgical method was practiced by Fauchard, improved by Bourvel, and has been taken up and advocated in late years by Dr. Siffre. It is applicable only to retroversion of the upper incisors. The technique of this method consists in grasping the tooth at its neck by means of a straight forceps, the beaks of which have been wrapped with cotton. The pressure, which should be slow, firm, and progressive, is applied from behind forward. The tooth should not be subjected to any rotation whatever, and should be carried forward to its normal position in an absolutely straight line.

Dr. Martinier concludes his communication with the report of a case in which a rotated central incisor was brought to its normal position by the method here described. He gives the reasons why he undertook this treatment in preference to the slow method. The age of the patient (seven and one-half years), his undermined constitution, and the position of the misplaced tooth, which would have rendered almost impossible the application of an appliance, were the factors which induced him to employ the surgical rotation.

[*Pacific Dental Gazette*, San Francisco, January 1904.]

THE VALUE OF A CORRECT ARTICULATION IN PROSTHODONTIA. BY HARVEY M. KIRK, LOS ANGELES, CAL.

The author states that faultless articulation in connection with artificial dentures is of superlative importance, and that if proper articulation be a feature to be observed in a fixed structure, such as a bridge or a crown, of how much greater importance it is in the case of an unfixed, or movable, artificial denture, when it plays such an important part in the retention of the denture. More artificial dentures are failures on account of incorrect articulation than from imperfect impressions or models. It is only necessary to mount properly upon an anatomical articulator the models of a normally developed mouth with both natural dentures perfect, to perceive at almost a glance the fundamental principles of the human articulation.

It will be observed, in the properly articulated models of a perfect natural denture, that there are two fundamental conditions, or relations, of the jaws and the teeth, viz, occlusion and articulation. *Occlusion* is what is wanted when the "bite" is taken, and is of itself but one movement, or relation, of the lower jaw to the upper; and that is, the up-

and-down, hinge-like movement, terminating when the jaws are at rest, the teeth all antagonizing each other properly, and the condyloid processes secure in the glenoid fossæ of the temporal bones. *Articulation* contemplates not only occlusion, but all the various movements of which the jaws are capable.

Upon the mounted models (and arrangement and articulation must be studied in this way), it will be seen upon moving the arches of the anatomical articulator in any direction—forward, backward, or laterally—that three points of the teeth will be in contact, viz, at the incisors and in each molar region. (If the models should seem not to answer to this test, it will, in all probability, prove to be due to inaccurate mounting.) If this be true regarding the natural organs of mastication, which are firmly fixed, it is only reasonable to conclude that artificial dentures so articulated would not only be following out nature's design, but that the tipping of the plates in the various movements of articulation would be largely prevented.

The author then takes up the arrangement of the teeth, and describes a method of locating teeth upon an entirely edentulous pair of jaws. Select a plaster model, the author says, of a perfectly normal upper natural denture, with the teeth all intact. With the compass measure the fullest width of the three anterior teeth, either side, from the mesial aspect of the central incisor to the distal aspect of the canine. Use this as a radius of a circle, which describe upon a piece of cardboard or thin sheet metal. Cut out the circular disk thus secured. With the model upon the table (teeth pointing upward), place this circular disk just inside of the edge of the six anterior teeth, the margin of the disk being on their incisive edge. The disk thus placed always bears a definite relation to each tooth of the arch, except the third molar. The six anterior teeth should barely show beyond the edge of the disk; these six teeth also will be found to be in an arc of a circle of 120°, or one-third of a circle; the first bicuspid will show but slightly more than the canines, the second bicuspid will be bisected, the edge of the disk passing through the fissure of the tooth. Usually the disk will brush the first molars somewhere on the anterior lingual third; the second molars will be entirely out of range, they continuing along in a straight line—for the bicuspid and molars are placed in a straight line from the canines backward, and not arched, as is often supposed. A line drawn through the sulci of these teeth will

clearly demonstrate this. The apparent curve is due to the size, shape, and contour, largely of the first and second molars. Upon connecting the distal aspects of the second molars by means of a straight line, this line will brush along the edge of the disk, when in position, thus demonstrating the equilateral form of the upper jaw and the arrangement of the teeth.

The practicability of this method is explained as follows—given upper and lower edentulous jaws properly mounted on the anatomical articulator: Select teeth of proper size and shape and color, arrange them in a substantially correct position upon the model, and wax up. With the compass measure the fullest width of the central incisor, lateral incisor, and canine of one, as was done on the other model. Secure the circular disk as before. Then rearrange the artificial teeth, according to the former experiment, on the model of the natural teeth.

If overbite be desired—and this is essential, in order to secure that scissor-like movement of the teeth so necessary to sever and cut the food—then the sulci of the molars must be ground deep and broad; and in the bicuspid the sulci are deepened and enlarged mesially and distally, but not directly through their centers. This will make possible a desirable interlocking of the cusps of the bicuspid teeth.

The upper teeth being properly placed upon the models, it is only necessary, of course, to arrange the lower teeth with regard to the uppers.

[*Dental Summary*, February 1904.]

PROPHYLACTIC VALUE OF FORM OF PROXIMATE FILLINGS. BY G. V. BLACK, CHICAGO, ILL.

The form given to approximal fillings is of the utmost importance in the prevention of recurrence of caries and in the prevention of the occurrence of diseases of the gums and periodontal membrane. The author states that the points to be attained are the preservation of the full mesio-distal breadth of the tooth, a correct form of approximal surface, a correct form of interproximal contact, and the health of the gum septum. The general rule will be that the original form of the teeth should be reproduced in the filling, but it often happens that the original form is not the best form, and in this case, when practicable, the form should be improved. The most essential features are that the contact point be well rounded, so that it will touch the approximal tooth only at a small rounded

point, and that this be sufficiently prominent to restore the original tooth-form, and therefore restore the full normal contour of the interproximal space.

The essayist calls attention to the disturbances following the insertion of fillings which do not restore the original contour of the teeth. In practice, the author states, cases are frequently seen in which the contact points have been lost through caries, and the teeth have crowded together, closing up the normal approximal space, until the necks of the teeth have come close together. Such spaces are usually a source of continual annoyance, for the reason that they hold debris, which is crowded upon the gum septum at every effort in mastication. The remedy is in the restoration of a normal form by restoring the breadth of the interproximal space and mesio-distal breadth of the teeth with the normal form of the contact point.

The author calls attention to cases in which a number of teeth have been filled without making this restoration, and the patient is in continual trouble, often to such a degree that mastication is seriously limited, or serious disease has resulted. In these cases the only remedy is the restoration of the normal form, as above indicated, by separating the teeth and refilling.

Dr. Black states that in cases in which approximal surfaces are very broad and flat and the embrasures narrow and shallow, it is best, whenever restoring these teeth, to slightly increase the mesio-distal breadth of the teeth as much as possible, and to make the points of contact more prominent than they originally were. This will increase the breadth of the interproximal space, giving greater comfort in mastication and reducing the liability to recurrence of caries. In cases in which from loss of contact by reason of caries or by improper previous operations involving a considerable number of teeth in the arch, considerable time should be allowed for the whole restoration, one or two of the spaces should be restored, and when possible a month of rest should be given for the general adjustment to the new condition in the arch; then one or two more spaces should be widened, and so continue to the finish. In this way a very considerable difference can be made in the arch without special difficulty. When the contact points between the teeth become flat-

tened by wear, as frequently witnessed in middle-aged or elderly people, Dr. Black recommends the cutting of an approximal cavity in one of the teeth, and after securing sufficient separation, to build a filling with a rounded contact point of sufficient prominence to open the embrasures sufficiently to prevent lodgments of food and to restore the health of the parts.

The author also discusses the restoration of contour in teeth with fillings that were originally inserted with the view of restoring the normal contour, but which have become flat by years of use. This may be remedied by removing the filling and making a new one, or, if the filling be large, by cutting a slot in it and building a new contact point. It may be accomplished by the easier method of cutting a smaller slot in the filling, and laying in that a piece of gold platinum or iridio-platinum wire long enough to rest against the next tooth, thereby forming a contact point. The wire is held in position by packing gold around it.

In highly susceptible persons, approximal cavities are very destructive to the teeth and destroy them quickly. In these cases caries is liable to attack the teeth in the order of their eruption, and it is often discovered within two to four years after the teeth have taken their places. These are the most difficult cavities to treat successfully. When the mesial surfaces of the first molars begin to decay while still in contact with the second deciduous molar, the author recommends that these teeth be filled with gold in children of good self-control and endurance. In the reverse condition, in which the teeth are excessively sensitive and the child very difficult to control, it is better to use gutta-percha or zinc oxyphosphate temporarily, until the shedding of the deciduous molar, when the approximal surface becomes exposed to view, favoring the insertion of a permanent filling. The operator must not be tempted by these favorable conditions into making this a simple cavity without due extension for prevention, or without cutting the full retention seat in the occlusal surface. A principal point in the treatment will be to determine what will be the area of liability when the bicuspid is in position, in order to include it in the area of the filling. Failure in either of these directions will be fatal to the future of the filling.

PERISCOPE.

Mummifying Paste.—Take tannic acid and thymol, of each equal parts, with glycerol sufficient quantity to make a stiff paste.—*Dental Brief*.

"Taking the Bite" for Crowns or Bridges.—For the purpose of taking bites for crown and bridge work, etc., modeling compound fills an important place, as it is easy to manipulate, sets sufficiently hard to prevent its being readily bent, and does not break when forced to a thin edge as does plaster.—J. F. WESSELS, *Dental Brief*.

When a Spoon is Full.—The American Pharmaceutical Association (*New York Medical Journal*) has indorsed the definition of a spoonful given by the French Codex as being when the liquid comes up to, but does not show a curve above, the upper edge of the bowl. An ordinary teaspoonful is equivalent to 5 cubic cc.—*Monthly Cyclopedia of Pract. Medicine*.

Mercuric Cyanid Not a Suitable Antiseptic.—Harrington has conducted laboratory experiments to test the value of mercuric cyanid as a surgical disinfectant. A 1:1000 solution of the pure salt was found incapable of destroying the staphylococcus pyogenes aureus in three hours' time. The author has tested the salt on other germs, and concludes that it is not a suitable preparation for use as a practical surgical antiseptic.—*New York Med. Journal*.

Porcelain as a Filling Material.—Coming to the question of repairing the teeth, making good the ravages of decay by some mechanical means, the introduction of porcelain inlays has, to my mind, been the greatest advance in recent years. Especially this is observed in front teeth in which half the substance of the tooth is gone. A gold filling takes a long time to insert, is attended by a great deal of physical discomfort, both on the part of the patient and the operator, and even when properly done leaves much to be desired from the esthetic point of view. Gutta-percha loses its fine surface and gets discolored, and zinc oxyphosphate has a fair appearance for a time, but soon becomes worn

down. Amalgam is easily inserted, but its color makes it impossible. The inlay does away with many of these objections. In interstitial cavities—if sufficient space be obtained—an impression of the cavity either by modeling composition or by foil is easily obtained, and with care the shape is not interfered with in the process of removal.—W. GRAHAM CAMPBELL, *Dental Record*.

Action of Formaldehyd on Steel Instruments.—It is claimed to be an advantage of the formaldehyd sterilization that it does not in any way injure even fine-edged instruments. The statement must be taken *cum grano salis*. Any instrument which is not perfectly dry rusts profusely; perfectly dry ones do not seem to suffer if left in only for an hour; left in for days they will rust very decidedly, so that we must conclude that a slight action takes place even on dry instruments.—W. D. MILLER.

Treatment of Nausea Produced by the Insertion of Impression Material.—It occasionally happens that considerable nausea is caused by the impression material on the soft palate. This tendency to nausea can be overcome by gargling with camphor water, or the use of a little cocain in solution on the palate, also by manipulating the palate with the end of the finger or a feather previous to taking the impression; a few doses of sodium bromid is also efficacious.—J. F. WESSELS, *Dental Brief*.

Proportion of Water and Plaster for an Impression.—An ordinary mix of plaster of Paris suitable for a good-sized impression requires about 40 cc. of water and 55 gm. of plaster. To the water, before the mix is made, should be added 5 gm. of potassium sulfate, to be thoroughly dissolved. The plaster is then slowly sifted into the water and the spatula carried slowly through the mass and around the sides of the bowl with a sweeping motion, just enough to insure a uniform mix. Then place quickly in the tray, and if too soft for introduction into the mouth, wait until it has set sufficiently to meet the requirements and then proceed.—J. H. PROTHERO.

A Method of Applying Dry Heat to Subdue Rheumatic Pain.—Another simple and effective means of applying dry heat, particularly to joints and surfaces, is afforded by sand, which is loosely inclosed in a flannel bag with linen lining, baked in an oven, and closely packed round the part. The effect lasts for half an hour, and is both comforting and curative in chronic joint affections and lumbago or muscular rheumatism. On a more extensive scale the subjects of rheumatoid arthritis in Egypt spend hours buried in the hot sand with remarkable benefit.—*Therapeutic Gazette.*

Taking Impressions of the Lower Jaw with Modeling Compound or Wax.—When taking an impression of the lower jaw in either wax or modeling compound, it is necessary that the cheek on each side be pulled out by inserting the finger along the buccal side of the impression tray so as to lift out the fold of the muscles that may have been caught under the edge of the tray and material. The patient should also be instructed to raise the tongue from the floor of the mouth and extend it, so as to prevent the impression from impinging upon the muscles beneath the tongue.—J. F. WESSELS, *Dental Brief.*

Restoration of Contour with Bridges.—When from loss of one or more of the anterior teeth in the upper jaw there is considerable absorption, the bridge should have porcelain gum or pink rubber to restore the contour and sustain the lip. The old plate gum teeth can be used to great advantage. When a bicuspid and molar are lost, with the usual absorption, and the adjoining molars and bicuspids are sound, I have found that a rubber bridge with properly made and adapted clasps answers every demand, obviating the grinding down of the teeth.—W. H. SHULZE, *Western Dental Journal.*

Magnesium Hydrate to Facilitate Removal of Plaster from Mouth.—It is in taking the impressions for partial dentures that the most difficulty is usually experienced. If the remaining teeth are short and straight, and no wedge-shaped spaces or undercuts are formed between them, little difficulty will be experienced. When the teeth are long or when the teeth incline toward each other and form dovetail spaces, or when several teeth are loose, then the condition is more complicated and must be dealt with accordingly. A good expedient in all cases of impression-taking for partial cases is to have the patient rinse the mouth with milk of magnesia just before

taking the impression. A thin coating of magnesia is left on the teeth, which seems to allow the plaster to be removed more readily.—J. F. WESSELS, *Dental Brief.*

Mixed Anesthesia.—Robertson reports the results he has obtained by giving one one-hundredth of a grain of hyoscin hydrobromid half an hour before the beginning of ether inhalations. He has tried the method, so far, fifty-seven times, and believes it to be of great value. Whether the injections of hyoscin hydrobromid are without danger, time alone will show. Among the advantages claimed for the innovation suggested the following may be enumerated: The period of excitement is shortened, and the excitement itself is reduced in intensity; complete anesthesia can be obtained in a shorter time (the average time required by the author in fifty-seven cases was five and one-half minutes); the quantity of mucous produced by the ether irritation is greatly reduced; vomiting after anesthesia is less frequent and less severe.—*New York Med. Journal.*

Etiology of the Hyperplasia of the Pharyngeal Tonsil.—From a consideration of the most recent views advanced, the following conclusions as to the origin of this condition are proposed by T. J. Harris (*Amer. Med.*, January 2, 1904): The first claim is that the pharyngeal tonsil possesses a distinct function. This function is of the nature of a defense against the entrance of bacteria and consists in a certain irrigation of the tonsil surface by a lymph stream loaded with lymphocytes. This protective function is in harmony with the inherent tendency of the tonsil to enlarge on the slightest irritation for the affording of further powers of defense. This inherent tendency is further seen in the frequent recurrence of the tonsil after removal. Strictly speaking, it is claimed that such enlargements are not a pathological, but a physiological process.—*Medical News.*

Protection of Soft Tissues when Applying Arsenic.—In all cases requiring the application of arsenic protect the gum by isolating the tooth, using the rubber dam whenever possible, and the next best material in its stead in cases when the rubber cannot be used—which cases are very few. My choice of the other materials is in the following order: Absorbent rolls, small antiseptic doilies, or a small pad of bibulous paper, held in place on the buccal and lingual surfaces of the gum close to the neck of the tooth with firm pressure by the thumb and fingers of the

left hand; and everything being ready, this need not be removed until the operation is complete. This may take a little longer, but the protection of your patient against the terrible results of arsenic coming into contact with the soft tissues is no more than is justly due him.—FREDERICK I. BARTLETT, *Dental Brief*.

The Nose, Throat, and Air-Passages and Disturbed Digestion.—The disturbance of the air-passages due to faulty digestion may be brought about in three principal ways:

(1) The nose and throat condition may be the expression of a general constitutional state. (2) They may result from direct irritation caused by acid eructations or vomit. (3) They may, in cases secondarily due to bacterial invasion, depend primarily on the reduced resistant power of the tissues caused by faulty or depraved nutrition. Digestive disturbances, on the other hand, may be directly due to the swallowing of unhealthy secretions from the nose and throat. They may also be due to other causes not quite clear. Clinical experience has shown that a certain number of cases of disordered digestion fail to improve until some septal deformity has been removed, or overgrown tonsils and adenoids ablated.—BEVERLY ROBINSON, *Boston Med. and Surg. Journal*.

Therapeutic Properties of Radium.—Although the early reports on the therapeutic properties of radium have been for the most part, thus far, very favorable, it is well to temper our credence with a certain amount of skepticism, until the early and somewhat meager reports are amply confirmed by a more prolonged and patient investigation. While it is highly probable, from its close analogy to X rays, that it will be demonstrated to possess positive therapeutic properties and may be destined to hold an important place in cutaneous medicine, we must not lose sight of the fact that, in its present form, its physical properties are decidedly weaker than those of the X ray; that it is a new and relatively untried remedy, and like all new and untried agents—we need only refer to the introduction into our therapeutics of electricity, liquid air, and the X ray by way of comparison—our expectations are usually enthusiastically great, while our realizations are often relatively small.—M. L. H., *Cincinnati Lancet-Clinic*.

Long Life.—Weber sums up the main points to be observed by those desirous of a long life, as follows: (1) Moderation in eating, drinking, and physical indulgence.

(2) Pure air out of the house and within. (3) The keeping of every organ of the body as far as possible in constant working order. (4) Regular exercise every day in all weathers, supplemented in many cases by breathing movements and by walking and climbing tours. (5) Going to bed early and rising early, and restricting the hours of sleep to six or seven. (6) Daily baths or ablutions, according to individual conditions, cold or warm, or warm followed by cold. (7) Regular work and mental occupation. (8) Cultivation of placidity, cheerfulness, and hopefulness of mind. (9) Employment of the great power of the mind in controlling passions and nervous fear. (10) Strengthening the will in carrying out whatever is useful, and in checking the craving for stimulants, anodynes, and other injurious agencies.—*New York Med. Journal*.

Expansion of Plaster.—In prosthetic procedures the principal difficulty resulting from expansion is in the warpage of impressions and models when allowed to stand in the tray for any length of time after the plaster of Paris has set. Perhaps the best illustration of this defect is shown in the experiment first described by Dr. W. Bowman McLeod, of Edinburgh, Scotland. On a flat slab, around the margins of which were firmly attached metal bars, plaster of Paris was poured and allowed to remain twenty-four hours. The plaster was then sawed diagonally through the center, when it was found it had arched up in the central portion, having left the slab to a very considerable extent, while the margins remained in contact with the slab. This was due to the fact that lateral expansion was prevented by the bars—which, however, did not confine the material on its upper surface, so that movement occurred in the direction of least resistance, and accounted for the arching of the plaster in the center.—J. H. PROTHERO, *Western Dental Journal*.

Effects of Crowning upon Pulp-Vitality.—My records show that ten per cent. of the pulps of teeth which have been capped have died within one and a half to two years from the time that the teeth were prepared and the cap put on. The grinding of a tooth to allow of a perfect-fitting cap, between the ages of twenty and forty, or before the horns of the pulp begin to calcify, conjoined with the irritating influence of the phosphoric acid in the cement retaining the cap, results not infrequently in its death. These fatalities can be reduced, first, by protecting the exposed dentin from the phosphoric acid with a coat-

ing of Canada balsam; second, by doing less grinding even at the expense of securing a less accurately fitting cap, in so far as the cap may be a line or two short of reaching the gum margin; third, by coating the tooth, especially the exposed portion, with a strong solution of silver nitrate. Of the two evils, a dead pulp or a cap leaving exposed a line or two of the tooth, the latter I think preferable.—J. CLARENCE SALVAS, *Dental Brief*.

Value of "Neck Sign" in Chloroform Anesthesia.—Fratti says that the value of the so-called "neck sign" of Bonneau in giving chloroform anesthesia has been overestimated by the last-named author. This sign consists in observing the tonicity of the neck muscles in narcosis. These are at first in a state of contraction, then they pass into a state of contracture which is reflex, induced by the operation or the preliminaries thereto; next the muscles are in a state of tonicity, and finally they become relaxed in extreme anesthesia. The anesthetist must keep the neck muscles in a state between the rigid tonicity and the absolute flaccidity mentioned. Fratti, however, points out that the contraction or flaccidity of the neck muscles in chloroform anesthesia is a matter of individual peculiarity, and by no means in constant relation to the depth of the anesthesia. He therefore considers the well-known signs of the pulse and respiration, the pupil and corneal reflexes, much more reliable than the so-called neck sign.—*New York Med. Journal*.

Adrenalin in Local Anesthesia.—Braun (*Centralblatt für Chirurgie*, 1903, No. 38) states that the two most important points to be considered in the use of adrenalin for this purpose are the dose and the danger of secondary hemorrhage. As regards the dose, such a powerful drug as it is should only be used with great care. A dose of 1 milligram is entirely too large to be subcutaneously injected. In one case an injection of 20 cc. of a 0.5 per cent. solution of eucaïn B with 10 drops of the 1:1000 adrenalin solution caused vomiting and prostration which lasted for an hour; in several other cases this dose caused some cardiac palpitation. Hartwig and others have had some very unfavorable symptoms from this dose, and Enderlen has reported a case where the injection of 8 cc. of cocain, with 8 drops of adrenalin solution, was followed by a fatal result. The best solution would seem to be one composed of hydrochloric acid 0.2, sodium chlorid 0.8, and distilled water 100 parts. Then 10 cc. of this mixture should be placed in a test tube and heated to the boiling point,

and 1 cc. of adrenalin added, when the solution is to be again boiled. This will give a colorless solution in which the greater part of the salt is neutralized by the adrenalin. Two drops of carbolic acid should be added and then the fluid should be kept in bottles holding from 3 cc. to 5 cc. This solution will keep indefinitely.—*Amer. Journ. of the Med. Sciences*.

Silver Nitrate to Arrest Caries: Does it Stimulate Odontoblastic Action?—Nitrate of silver is now my main reliance for stopping and preventing caries, but it has only been for about three years that I have used it on sound teeth to make them immune from caries and build up strong, hard tooth-substance to resist the approach of caries. You are all familiar with its effects on erosion, superficial caries, and defects where softening of the tooth commences and the disintegration is not deep enough to require filling. The use of AgNO_3 under varying conditions has been recommended largely and earnestly by American writers, commencing with Brooks in the year 1854 in the *American Journal of Dental Science*, as quoted by Szabo (*Oester.-ungar. Vierteljahrsschrift für Zahnheilkunde*, January 1902) in his most comprehensive résumé of the literature of silver nitrate, which I have largely drawn from, and his valuable addition to the histological and clinical phases of its place in dentistry. Stebbins, in the *International Dental Journal* for October 1891, was my first inspirer in the use of AgNO_3 , and since reading his article, in which he described his treatment of school-children's teeth, only in cavities and on other defective surfaces, I have used it in increasing quantities, and have finally come to look upon it as not only a valuable treatment for defects in the teeth, but for stimulating new activity in the tooth-building cells.—L. C. BRYAN, *Dental Review*.

Filling Adjoining Approximal Cavities in Deciduous Molars.—The problem of filling two cavities where they face each other so as to protect that space is a serious one. For some years I have been following this plan: Where two molars are decayed, the second on the mesio-occlusal surface and the first on the disto-occlusal surface, I bridge across them from one cavity to the other, thus protecting the interproximal space. The thing of all others at this time is to give the child comfort, and that as soon as possible, even if the work be only temporary. I believe in the necessity of doing temporary work in children. The effort to do permanent

work has done much harm; we must give these little patients relief with as little pain as possible. When I put gutta-percha in those cases I protect the gum in the interproximal space by using a metal guard across the space; otherwise the gutta-percha will wedge down, and while the patient may not complain, yet it sets up an irritation that is not very desirable. I rest the metal guard on the gingival wall of one cavity and extend it across to the gingival wall of the other cavity. I find that to be the most satisfactory way of managing those cases. It is a very slight operation; it gives comfort, and I have been able to manage the most difficult of these cases more satisfactorily with that method than when I attempted to fill the cavities separately. The main thing is to give the child relief and without taxing it too much.—C. N. JOHNSON, *Dental Review*.

Etiology of Fetor of the Breath.—An offensive breath is a functional disorder liable to occur at all periods of life. Men are more subject to it than women, on account of their irregular habits and diet. It is an important and characteristic symptom of many morbid conditions found in the nose, mouth, throat, chest, and stomach, and varies in intensity. In the oral cavity itself, decayed teeth, accumulations of tartar, and diseases of the gums and maxillary bones and of the mucous membrane are the most frequent causes of this offensive condition. There is a tendency among the laity to ascribe to decayed teeth all fetor emanating from the oral cavity; and while these are undoubtedly very active agents in the production of offensive odors, still the more lasting and persistent odors are due to the chronic and exudative diseases of the gums, bones, and mucous membranes.—H. JEROME ALLEN.

Carbonized Cotton as a Carrier for Arsenic.—As a carrier for arsenic in devitalizing pulps this is very useful on account of the ease with which the paste can be applied precisely on the spot required, and the absence of any pressure or irritation resulting from it. In using it for this purpose my method is to saturate a small portion of the carbonized cotton with any suitable antiseptic, such as carbolic acid and oil of cloves equal parts, remove the excess of fluid with spunk or bibulous paper, so as to have the cotton just moist. I then take up a small quantity of the paste on a spatula, place on the carbonized cotton as I hold it between the points of my dressing pliers, and then carefully carry it to place. The carbonized cotton being so very light and moist is almost

drawn to place by capillary attraction, so to speak. Another piece of moist carbonized cotton larger than the former is then placed over the first piece, and the cavity hermetically sealed. I have never had any pain resulting on account of undue pressure upon an exposed pulp when applied in this way, and sealing as above stated with formalin cement mixed rather thin.—A. JESSEL, *Dental Review*.

Sodium Dioxid in the Treatment of Root-Canals.—In treating teeth having putrescent pulps, I find that the 50 per cent. solution of Na_2O_2 is the best preparation to get the canals thoroughly clean. The Na_2O_2 forms soap with the fatty constituents of pulp-matter, and is easily removed by repeated syringing with warm water. Anyone who has not used the Na_2O_2 would be astonished at the effect produced by its thorough application. In cases of abscess I follow the above treatment, and inject a few drops of aromatic sulfuric acid through the canal into the abscess sac; then dry the canals, dress them with wood creasote, and cover with temporary stopping for three days. At the next visit apply rubber dam, remove dressings, wash the cavity out with H_2O_2 , 5 per cent.; then use alcohol; dry, and dress again with wood creasote for a week. By that time the tooth is generally ready for filling. I could quote case after case so treated, and in eighteen months I have had no report of after-trouble. It is really when we come to the question of bicuspid and molar canals that we are forced to realize that some other method than attempting to clean out the canals and fill the same is necessary in the vast majority of cases.—C. A. FETHE.

Electrolysis.—When acids, salts, or bases are dissolved in a liquid, usually water, the molecules of these compounds break up into ions. The resulting solution possesses the property of conducting an electric current, and is, according to Faraday, called an electrolyte. When such a current passes through the electrolytic solution the latter undergoes certain changes which are generically termed electrolysis. If, on the other hand, a liquid has not the power of dissociating molecules into ions, it cannot conduct an electric current. Now, according to Arrhenius, the conductivity of an electrolyte is proportional, depending upon (1) the number of ions, (2) the relative electric charge of these ions, and (3) the speed of the ions. Further, the resulting ions depend, with limits, on the degree of dilution of the solution; a certain definite dilution dissociates completely all

molecules, and further dilution merely separates the ions farther from each other. For example, if sodium sulfate (Na_2SO_4) is dissolved in water, two positive Na ions (kations) and one negative SO_4 ion (anion) are the result. Water has, so far as known, the greatest dissociating power, with the possible exception of hydrogen dioxid. However, formic acid, methyl alcohol, ethyl alcohol, ammonia, and others are known to possess this peculiarity to a more or less degree. The organic compounds are much less dissociated than inorganic salts, and their ions are more complex and are very little understood at present.—HERMANN PRINZ, *Dental Era*.

Why Round-Faced Pluggers should be Employed.—The *spreading* properties of gold are so well known that it seems scarcely worth while to dwell upon them, yet there are many dentists who fail to take advantage of the well-known characteristic in operative procedures. A mechanic understands the value of a convex face on one end of his hammer-head when riveting a bolt or spreading a metal plate. The dentist in his laboratory knows how to take advantage of the spreading property of gold in swaging a plate around a remaining tooth, or over the heel of the process, or if he has made a crown band too small it is readily stretched by laying over the convex surface of a projection from the anvil and tapping with a flat-faced hammer, thereby spreading portions of the mass. The goldbeater depends upon the convexity of his hammer as he beats the gold leaf to spread it in the vellum cutch or molds from an inch square to the usual four-inch square size. Indeed, the malleability of gold seems to be well understood by our profession in every department of constructive work, except operative procedures at the chair. If search be made through the pluggers of the supply houses, but very few will be found whose impacting points are other than flat, whatever the form of the plugger end may be, and fewer still will be found, in proportion to the number kept, in the individual dental equipment; yet a mass of gold melted and run into a cylindrical form and placed in a circular cavity with parallel walls, not too deep, and just large enough to take the cylinder—allowing it to slip in and out readily—can be so “riveted” or spread in the cavity with a convex-faced plugger that it will be made to fit the cavity and hermetically seal the orifice. How much better this can be done by spreading the gold piece by piece as inserted, spreading the mass laterally, causing it to hug tightly the cavity wall from the base or seat to the surface. I feel sure

that practitioners generally have not understood the ease with which moisture-tight fillings can be made by taking advantage of this characteristic of gold, and that a flat-faced plugger will not spread the mass.—D. M. CATTELL, *Dental Review*.

“Ether = Sulfuric Acid Preparation” in the Treatment of Putrescent Teeth.—I wish in passing to say just a word in regard to the sulfuric ether preparation for the treatment of putrescent teeth and for enlarged or constricted canals. We are familiar with the Callahan method and the good results following it. But we in our practice have obtained even better results from the preparation which Dr. Herbst recommends for obtunding sensitive dentin. This is prepared in the following way: A small portion of C. P. concentrated sulfuric acid is put into a glass vial, and to this is added sulfuric ether, stirring constantly with a glass rod until the acid is saturated. This is easily ascertained, for the excess of ether floats on the surface of the acid as a lighter colored liquid. This superfluous ether is then allowed to evaporate. Dr. Herbst also adds a few crystals of cocain hydrochlorid, and I find the addition very favorable, acting as it does as an obtundent. This chemical compound has great penetrating properties, and it is this, together with the fact that it can be quickly evaporated with warm air when desirable, which makes it so much more valuable than the sulfuric acid alone, such as Dr. Callahan uses. Its action, moreover, seems to be less irritating than the above.—A. JESSEL, *Dental Review*.

Treatment of Exposed Pulp in Children.—When an exposed and inflamed pulp is brought for treatment, the first procedure is to syringe out the cavity with warm water, and remove all of the débris and decalcified dentin with an excavator. This may readily be done with almost no pain, if the operator be careful not to touch the pulp. After the cavity is cleaned as perfectly as possible it is usually best to slightly puncture the pulp with a fine explorer to induce a free flow of blood. This may cause momentary pain, but it is only momentary, and subsequent relief is thereby assured. When the pulp begins to bleed, warm water should be gently syringed into the cavity till the bleeding ceases, by which time the tooth will usually be comfortable. Make a paste of oil of cloves with the powder supplied with zinc oxyphosphate, gently pat it over the exposure, and seal the cavity carefully with gutta-percha. A pulp treated in this way will remain comfortable till it dies, and the first indication of death is a slight soreness

in the tooth on pressure. Instruction should therefore be given to bring the little patient to the office on the first symptom of soreness, when the gutta-percha may be removed, and the canals treated in the usual way. Of course there is occasionally the possibility of the case being neglected, as other cases often are, till an abscess starts, but this is a contingency for which the dentist is not responsible, and usually if an abscess does begin it can readily be relieved by opening the cavity to give it vent, syringing it out well with warm water and applying an antiseptic.—C. N. JOHNSON, *Items of Interest*.

The Relative Toxicity of Protargol, Collargol, and Argyrol.—Before the Société de Médecine de Lyon, M. Petitjean read an interesting paper on the relative toxicity of these salts when employed in intravenous injection. The subjects of the experiments were dogs. A solution of argyrol 1:50 was used. An amount equal to 0.3 ctgm. per kilogram of the body weight injected into the jugular vein caused death in about twenty hours. There was no disturbance of the respiratory and circulatory systems, and death followed in coma without pain. There was no obvious lesion to account for this. When a relatively larger dose was injected, 0.5 ctgm. per kilo, death followed rapidly from edema of the lungs. Argyrol was found in this respect much less toxic than either protargol or collargol; 0.02 ctgm. per kilo of the former produced the same effect as 0.5 ctgm. of argyrol. The lack of obvious lesions seems to point to some change in the blood itself as the cause of death in coma. Argyrol is a preparation in which the silver is combined with vitellin to the amount of 30 per cent. It seems at present likely to take a chief place in the armamentarium of the ophthalmic surgeon. It is, according to the best accounts, which I have to some extent verified for myself, an active preparation, bringing about the cure of purulent ophthalmia with rapidity, and is absolutely painless, even in 25 per cent. solution. This allows it to be used with ease, when even protargol could not be borne. For purulent ophthalmia of the newborn, a 25 per cent. solution may be dropped into the eyes every three or four hours. For trachoma the same solution may be rubbed thoroughly into the lids without causing pain. In the case of nervous children this is an enormous advantage.—H. B. G., *Treatment*.

Never Apply Arsenic to a Deciduous Tooth.—When a pulp becomes exposed in one of the deciduous molars the problem arises

as to how it shall be treated. Usually these pulps are not very tenacious of life and so are not susceptible to treatment for their preservation. And yet it would seem undesirable, in view of all the conditions surrounding the case, to make an application of anything so powerful as arsenic to destroy a pulp in a deciduous tooth. The distance from the point of exposure to the apical foramen is not very great, and the vascularity in these young tissues is more pronounced than in adult life, so there is always the possibility of the effects of the arsenic being carried beyond the tooth into the apical space. This is especially true if absorption of the end of the root has begun preparatory to the admission of the permanent tooth. Added to this is the difficulty of securing perfect sealing of the agent in these young mouths where the control of the patient is usually not so certain as with adults, and where the area between the point of exposure and the gingival margin of the cavity is exceedingly limited. If an exposure occurred in an occlusal cavity and the pulp were very troublesome and persistent of life, there might be some justification for applying a minute quantity of arsenic, but these conditions so seldom arise that it may be stated as a safe rule never to apply arsenic to a deciduous tooth. The seriousness of the effects of arsenic when carried beyond the apex in children's teeth may easily become very great, and the necessities of the case do not ordinarily call for so evident a risk. As has been stated, these pulps 'do not die hard, and if given a reasonable chance they will ordinarily disintegrate of their own accord. The problem is merely to keep them comfortable.—C. N. JOHNSON, *Items of Interest*.

Glossitis and Stomatitis due to Streptococcic Infection occurring in Madagascar.

—The affection described by Drs. Fontozmont and Jourdran in *La Presse Médicale*, is endemic in Madagascar, and occasionally becomes epidemic. It is characterized by a desquamation or exfoliation of the mucous membrane of the tongue, which spreads to the mucous membrane of the cheeks, and frequently to that of the lips. The tongue presents the appearance of exfoliation in parts, which are shining as if varnished. In the vicinity of the fungiform papillæ the mucous membrane is villous, and of a raspberry color. The portions of the tongue which are not yet attacked are covered with a grayish white fur more or less thick. The affection commences by the appearance on the tongue of a number of red spots, each about the size of a pinhead. Each of these lesions increases in size at the per-

iphery and then, by the union of several of them, the larger patches are produced. In some cases the process goes on until the whole tongue is involved, the organ then resembling that which is characteristic of scarlatina. The mucous membrane of the cheeks may be involved in a similar manner a few days later. Generally only one side is affected. The cheek lesion commences as a small ulceration, which in the course of a few days changes into a patch whose borders are raised and prominent, circular in outline. The lips may be similarly involved, but much less commonly. In some cases the whole process is confined to the tongue, but the authors have never seen cases in which the lips and cheeks were involved, the tongue remaining unaffected. In every case the submaxillary glands were more or less markedly enlarged. General symptoms are often absent; if pres-

ent, they are very slight, consisting only in a complaint of malaise, lasting about twenty-four hours. The malady is never serious, leaves no debility behind it, and appears to amend spontaneously yet surely if it be untreated. It affects the natives at Tananarivo, but the Europeans are equally liable to be attacked. At certain seasons small epidemics break out, and a very large number of people are affected. In every case streptococci have been found in the local lesion. The authors have not met with cases of this malady except in Madagascar, and they regard it as being *sui generis*, and caused by streptococci. The disease has always yielded to treatment by mouth-washes containing carbolic acid, and by the application to the lesions of glycerin and borax. Cure ensues, when the affection is thus treated, in about a week.—H. W. S., *Treatment*.

HINTS, QUERIES, AND COMMENTS.

REPAIRING FRACTURED PLASTER CASTS.

A VALUABLE method of repairing fractured plaster casts may be found in the use of celluloid dissolved in camphor and ether to a creamy consistence. A good quality of celluloid should be selected, and to it should be added a mixture of equal parts of ether and spirits of camphor. This combination dissolves celluloid rapidly, and should be added to the material until a solution of a creamy consistence is obtained. The preparation should be kept tightly corked to avoid its evaporation.

When it becomes desirable to repair broken

casts, the fragments to be attached should be well dried and both surfaces should be freed from broken particles. The surfaces should be coated with the celluloid solution, and after being pressed firmly, should be allowed to dry.

This method the writer has found to possess many advantages over the common practice of attaching the fragments by means of resinous products. The line of union is impervious to moisture, and plaster casts thus repaired have been found to resist the stress of flaking, boiling, packing and pressing in the process of vulcanizing.

S. MERRILL WEEKS.

OBITUARY.

DR. JOHN H. BATCHELDER.

DIED, at his home in Salem, Mass., January 7, 1904, after a long illness, Dr. JOHN H. BATCHELDER.

John H. Batchelder was born in Beverly, Mass., January 16, 1817. He was the oldest of the twelve children of Col. Henry and Abigail (Mann) Batchelder of Beverly,

and was a great-grandson of Benjamin Pierce of Salem, who was killed at the battle of Lexington, April 19, 1775. He received his education in the schools of his native place, and at the New Hampton, N. H., Academy. When a young man he was for a time messenger in the Merchants' Bank, in Boston, and was afterward in business in New York and

Philadelphia. He finally decided to seek his fortune in the Far West. From Philadelphia he went to Buffalo, then on to the great Northwest Territory, reaching the present state of Wisconsin just after the Black Hawk war. He journeyed on horseback through a dense forest to a clearing known as Summit, Wisconsin, and at once engaged in trading with the Indians, and with success. Returning to Boston, however, he decided to adopt the profession of dentistry, and studied with that object. He was for a time a student of Dr. Morton, known in connection with the discovery of the anesthetic properties of ether.

He practiced his profession for fifty-six years, fifty-four years in Salem, occupying for forty-three years the same office, at 137 Washington street, which was also his residence. He possessed great mechanical skill and ingenuity, and had a large and lucrative practice. He retired in February 1901. He was president of the Massachusetts Dental Society in 1878-79, president of the American Academy of Dental Science from 1885 to 1887, and later was made an honorary member of both societies. In politics he was a republican. He was a genial gentleman, most conscientious and painstaking in whatever he undertook, and one who enjoyed to an unusual degree the respect and esteem of his fellow citizens. He was also a public-spirited man, ever ready to give the best of his valuable services to the public in whatever capacity he was called upon to serve. He was five years in the city council, being a member when Wenham Lake water was introduced. He was a member of the school board, also of the board of aldermen for four years, and for three years was its president. On July 4, 1865, just at the close of the Civil War, he was chief marshal of the floral procession, which was a memorable event in the annals of Salem. In 1866-67 he was a member of the Massachusetts House of Representatives. He was a member of the Veteran Corps, Salem Cadets, in 1883.

On April 21, 1903, a complimentary dinner was given to him by some of the leading dentists of Boston.

He was married October 22, 1839, to Jane Reed Smith, daughter of Elisha and Mary Butler (Bass) Smith of Boston. Mrs. Batchelder died June 12, 1899. Of six children, two

are now living—Mrs. Osgood of Salem, widow of Charles Stuart Osgood, late register of deeds, and Mrs. Hassam, wife of John T. Hassam, a lawyer of Boston. There are also six grandchildren and two great-grandchildren.

DR. GEO. OSBURN GAYMOND.

DIED, at Dedham, Mass., October 7, 1903, of diabetes and complications, GEORGE OSBURN GAYMOND, D.D.S.

Dr. Gaymond was born in Boston, October 2, 1872. He was a graduate of the Dedham high school and of the Dental Department of Harvard University, from which institution he received the D.D.S. degree in 1898. He held membership in several Masonic orders, and in the Delta-Sigma-Delta Dental Fraternity.

Dr. Gaymond was married in 1902 to Miss Ida Frances Morse of Norwood, Mass., who survives him.

DR. JAMES W. LEAHY.

DIED, September 20, 1903, of cerebral hemorrhage, JAS. W. LEAHY, M.D., D.D.S., in the thirty-fifth year of his age.

Dr. Leahy was a native of Cincinnati. Educated at St. Xavier's school, he entered the office of Dr. S. H. Wardle, one of the pioneers in dentistry, and graduated from the Ohio College of Dental Surgery in 1890. Having removed to Harrison, Ohio, he practiced there until the organization of the Cincinnati College of Dental Surgery, when he accepted the chair of prosthetic dentistry in that institution, which he filled for several years. He also occupied the chair of chemistry and materia medica, resigning in 1899. While insisting on discipline, he was able to win the respect and friendship of the students, many of whom will miss his advice. Dr. Leahy was also a graduate of the Ohio Medical College.

He was a very prominent member of the Knights of Columbus, the Independent Order or Foresters, and the Elks.

It is considered probable that Dr. Leahy's fondness for study contributed to his untimely end.

SOCIETY NOTES AND ANNOUNCEMENTS.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization Dental Congress.

H. J. BURKHART, Chairman.

E. C. KIRK, Secretary.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen.
- IV. Hygiene, Prophylaxis, Therapeutics, Materia Medica, and Electro-therapeutics. Chairman, A. H. Peck.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown.
- VI. Orthodontia. Chairman, E. H. Angle.

VII. Operative Dentistry. Chairman, C. N. Johnson.

VIII. Prosthesis. Chairman, C. R. Turner.

IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy.

X. Legislation. Chairman, Wm. Carr.

COMMITTEES.

Following are the committees appointed:

Finance. Chairman, C. S. Butler.

Program. Chairman, A. H. Peck.

Exhibits. Chairman, D. M. Gallie.

Transportation. (To be appointed.)

Reception. Chairman, B. Holly Smith.

Registration. Chairman, B. L. Thorpe.

Printing and Publication. Chairman, W. E. Boardman.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey.

Dental Legislation. Chairman, Wm. Carr.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel.

Membership. Chairman, J. D. Patterson.

Educational Methods. Chairman, T. W. Brophy.

Oral Surgery. Chairman, G. V. I. Brown.

Prosthetic Dentistry. Chairman, C. R. Turner.

Local Committee of Arrangements and Reception. Chairman, Wm. Conrad.

Essays. Chairman, Wilbur F. Litch.

History of Dentistry. Chairman, Wm. H. Trueman.

Nomenclature. Chairman, A. H. Thompson.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the world. Chairman, Wms. Donnelly.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.

Prize Essays. Chairman, James Truman.

Oral Hygiene, Prophylaxis, Materia Medica, Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck.

Operative Dentistry. Chairman, C. N. Johnson.

Resolutions. Chairman, J. Y. Crawford.

Clinics. Chairman, J. P. Gray.

Nominations. (To be appointed.)

Ad interim. Chairman, G. V. I. Brown.

The officers of the Congress, president, vice-presidents, secretary, and treasurer, will be elected by the Congress at large at the time of the meeting, and will be nominated by the Nominating Committee.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,

E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.

DAVID R. FRANCIS, *President of Exposition*.

Fourth International Dental Congress.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

J. A. LIBBEY, *Chairman*,

524 Penn Avenue, Pittsburg, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing membership as prescribed by the Committee on Membership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of dentistry*. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state chairman, whose indorsement is a certification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the Committee earnestly appeals to each eligible practitioner in the United States who is interested in the suc-

cess of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are—

General Chairman—J. A. LIBBEY, 524 Penn Ave., Pittsburg, Pa.

States.

Alabama. H. CLAY HASSELL, Tuscaloosa.
 Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.
 California. H. P. CARLTON, Crocker Bldg., San Francisco.
 Colorado. H. A. FYNN, 500 California Bldg., Denver.
 Connecticut. HENRY McMANUS, 92 Pratt St., Hartford.
 Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.
 District of Columbia. W. N. COGAN, The Sherman, Washington.
 Florida. W. G. MASON, Tampa.
 Georgia. H. H. JOHNSON, Macon.
 Idaho. J. B. BURNS, Payette.
 Illinois. J. E. HINKINS, 131 E. 53d St., Chicago.
 Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.
 Iowa. W. R. CLACK, Clear Lake.
 Kansas. G. A. ESTERLY, Lawrence.
 Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.
 Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.
 Maine. H. A. KELLEY, 609 Congress St., Portland.
 Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.
 Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.
 Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.
 Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.
 Mississippi. W. R. WRIGHT, Jackson.
 Missouri. J. W. HULL, Altman Bldg., Kansas City.

Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.

New Hampshire. E. C. BLAISDELL, Portsmouth.

New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.

New York. B. C. NASH, 142 W. 78th St., New York City.

North Carolina. C. L. ALEXANDER, Charlotte.

Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.

Oklahoma. T. P. BRINGHURST, Shawnee.

Oregon. S. J. BARBER, Macleay Bldg., Portland.

Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.

Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.

South Carolina. J. T. CALVERT, Spartanburg.

South Dakota. E. S. O'Neil, Canton.

Tennessee. J. P. GRAY, Berry Block, Nashville.

Texas. J. G. FIFE, Dallas.

Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.

Vermont. S. D. HODGE, Burlington.

Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.

Washington. G. W. STRYKER, Everett.

West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.

Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.

For the Committee of Organization,

EDWARD C. KIRK, *Secretary*.

TRANSVAAL DENTAL SOCIETY.

THE annual meeting of the Transvaal Dental Society was held recently, when the following officers were elected: H. Fielden Briggs, president; W. J. Trembath, president-elect; A. M. Holloway, honorary secretary and treasurer. Committee—W. Sandford Cottrill, D. W. Sims, W. D. Quinn, W. Tayler. Representatives—W. F. Tullock, Pretoria; W. Sandford Cottrill, Heidelberg. Honorary member—W. Marsh, Natal.

The past year shows an increased membership. Various papers and demonstrations have been given by the members; also papers by H. Temple Mursell, M.B., F.R.C.S., and A. R. Friel, M.D., F.R.C.S.I.

A great part of the time of the monthly

meetings has lately been taken up in drafting a new Dental Act. This, *inter alia*, prevents the actual practice of unregistered dentists or companies. Even at the present time the law in force provides against practice and also the use of titles by unlicensed persons. Two convictions have been obtained for practicing without a license, the qualification necessary for obtaining which is that the applicant shall be entitled to be registered as a dentist in Great Britain.

A. M. HOLLOWAY, *Sec'y*,
P. O. Box 5528, Johannesburg.

NEW YORK INSTITUTE OF DENTAL TECHNIQUE.

At the first annual meeting of the New York Institute of Dental Technique the following officers were elected for the ensuing year: Frederick C. Brush, president; W. B. Short, vice-president; C. M. Hoblitzell, secretary and treasurer. Executive Committee—W. B. Short (chairman), 242 Lenox ave., Manhattan; J. H. Tuttle, Brooklyn; E. D. Reed, Manhattan.

The object of this society is the general advancement of dental technics and the technical skill of its members. The society has met with immediate success, and its monthly meetings are well attended.

The next regular meeting will be held Friday, March 11, 1904, at which time Dr. E. A. Bogue will be the guest of the evening and will give the demonstration and address.

Ethical practitioners desiring further information regarding this society may address

F. C. BRUSH, *Pres.*,
1183 Broadway, Manhattan,
C. M. HOBLITZELL, *Sec'y*,
478 West 145th st., Manhattan.

KANAWHA VALLEY DENTAL SOCIETY.

The dentists of Charleston, W. Va., met on January 4, 1904, and organized the Kanawha Valley Dental Society, with the following officers: J. N. Mahan, president; Gwynn Nicholson, vice-president; H. S. Barr, secretary; F. R. Butts, treasurer.

Any ethical practitioner in the Kanawha Valley is eligible for election to membership.

H. S. BARR, *Sec'y*, Charleston, W. Va.

DENTAL BOARD OF NEW SOUTH WALES.

ELECTION OF MEMBERS OF DENTAL BOARD.
(Pursuant to *Dentists Act*, No. 45 of 1900.)

I THE undersigned hereby notify that the following persons were the successful candidates at the recent election of the Dental Board of New South Wales held on the eighteenth day of December 1903, viz:

Medical Practitioners.—Sir James Graham, K.B., M.D.; Arthur Palmer, M.B., F.R.C.S.

Dentists.—Henry Peach, D.D.S.; Cornelius Charles Marshall; Charles Hall; Charles George Hodgson.

And I hereby declare the said Sir James Graham, Arthur Palmer, Henry Peach, Cornelius Charles Marshall, Charles Hall, and Charles George Hodgson to be duly elected as members of the Dental Board of New South Wales.

Witness my hand at Sydney this nineteenth day of December, 1903.

HORACE TAYLOR, J.P., *Returning Officer*.

READING DENTAL SOCIETY.

The Reading Dental Society—a progressive and energetic organization—held its sixth annual banquet on Thursday evening, February 4, 1904, with covers laid for thirty.

The guest of honor, Dr. Walter H. Neall, read a paper on "Food and Health from a Dental Standpoint."

Other visitors were Drs. Roberts, Gardiner, Weeks, and McFadden, from Philadelphia.

The society, which meets monthly at different places, has a membership of thirty.

The officers for 1904 are as follows: Wm. H. Scholl, president; Chas. E. Grim, vice-president; Elwood Tate, treasurer; C. R. Scholl, secretary. Executive Committee—Geo. Schlegel, E. W. Bohn, S. E. Tate.

C. R. SCHOLL, *Sec'y*, Reading, Pa.

G. V. BLACK DENTAL CLUB.

At the first annual meeting of the G. V. Black Dental Club of Chicago, held December 8, 1903, the following officers were elected for 1904: Arthur D. Black, president; Frederick W. Parker, vice-president; Ralph W. Parker, secretary and treasurer.

RALPH W. PARKER, *Sec'y*, Chicago, Ill.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE next annual meeting of the American Dental Society of Europe will be held at the Hamburger Hof, Hamburg, Germany, April 1 to 4, 1904.

CHAS. J. MONK, *Hon. Sec'y.*

CALIFORNIA STATE DENTAL ASSOCIATION

AND THE

ALUMNI ASSOCIATION OF THE DENTAL DEPARTMENT, UNIVERSITY OF CALIFORNIA.

THE California State Dental Association and the Alumni Association of the Dental Department of the University of California will meet jointly in annual session, May 16 to 19, 1904.

Eastern specialists on porcelain and orthodontia have been invited to give a course of instruction on their several subjects at this session, and efforts are being made to eclipse all previous sessions from the standpoint of progress and interest to the profession.

GUY S. MILLBERRY, *Sec'y Joint Com.*,
1202 Sutter st., San Francisco, Cal.

MISSISSIPPI VALLEY DENTAL ASSOCIATION.

ON October 20, 1903, the dentists of Pike co., Ill., and Pike co., Mo., decided to organize a dental society to be known as the Mississippi Valley Dental Association, comprising the counties of Lincoln, Pike, Marion, Ralls, and Audrain, in Missouri, and Pike, Calhoun, and Green, in Illinois. The society met in Louisiana, Mo., electing Dr. Chas. L. Meriweather of that place as president, and Dr. G. Lansdowne as secretary and treasurer, until the meeting in May 1904.

SOUTHERN DENTAL SOCIETY OF NEW JERSEY.

AT the annual meeting of the Southern Dental Society of New Jersey held at Camden, N. J., Wednesday evening, January 20, 1904, the following officers were elected: Alphonso Irwin, Camden, president; W. A. Jaquette, Salem, vice-president; Stanley Ironside, Camden, recording secretary; Cromwell Ironside,

Camden, corresponding secretary; Mary Morrison, Salem, treasurer; J. G. Halsey, Swedesboro, librarian. Executive Committee—W. W. Crate, Camden; J. G. Halsey, Swedesboro; Chas. P. Tuttle, Camden; Chas. P. Tuttle, Jr., Phila.; E. E. Bower, Camden; O. E. Peck, Bridgeton. Membership Committee—Alphonso Irwin, W. A. Jaquette, W. H. Gelston, East Camden.

W. W. CRATE, *Chairman Ex. Com.*

NEW HAVEN DENTAL ASSOCIATION OF CONNECTICUT.

THE annual convention of the New Haven Dental Association will be held March 15 and 16, 1904, at Harmonie Hall, New Haven, Conn.

This promises to be the largest meeting ever held in the East, with a large number of clinics and one of the finest exhibits ever shown.

Essays are to be expected by the following distinguished members of the dental and medical professions: Drs. R. Ottolengui, New York; Henry C. Boenning, Philadelphia; G. Lenox Curtis, New York city; Herbert L. Wheeler, New York city; R. A. McDonnell, and Wm. H. Metcalf, New Haven. A large clinic from residents of New York, New Jersey, Pennsylvania, Massachusetts, and Connecticut, and two surgical clinics should suitable cases be presented. The business meeting will be dispensed with, thereby allowing ample time for the thorough discussion of all papers.

It will amply repay all to attend this convention, and enable those who have never had an opportunity to visit the Elm City, the privilege of the freedom of Yale University and the campus.

The arrangement committee have been especially active, having arranged for a banquet on the evening of the first day, and in addition are arranging with the Northeast Passenger Association for a one-and-a-third rate on the certificate plan, provided one hundred tickets are sold for seventy-five cents or over. (Secure certificate when purchasing ticket.)

An invitation is extended to all ethical practitioners to join with us, and take active part in our meeting.

FREDERICK H. BROWN, *Pres.*,
E. FRANK COREY, *Sec'y.*

NEW YORK STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting of the New York State Dental Society will be held at Hotel Ten Eyck, Albany, N. Y., May 13 and 14, 1904.

Special rates have been secured at the hotels Ten Eyck and The Kenmore; also special railroad rates on the certificate plan with the Trunk Line Association.

The business committee have prepared a most excellent program, and assure to all who attend an unusually instructive and interesting meeting, with essays by the following well-known and prominent men of the profession: "Porcelain," E. N. Jenkins, Dresden, Ger.; Joseph Head, Philadelphia; C. H. Land, Detroit. "Pyorrhea Alveolaris: Its Causes, Sequelæ, and Cure," D. D. Smith, Philadelphia. "Prophylaxis," Geo. E. Hunt, Indianapolis, Ind. "Gold as a Filling Material: Is It Still Important?" B. Holly Smith, Baltimore, Md. (Subject to be announced) W. J. Turner, Brooklyn, N. Y. "Our State Society: A Study and an Appeal," C. W. Stainton, Buffalo, N. Y. "The Pericementum" (with lantern slide demonstration), I. L. M. Waugh. (Subject to be announced) A. H. Peck, Chicago, Ill.

Fellow practitioners conversant with the various subjects announced will open the discussions.

Exhibitors desiring space will please address Dr. J. L. Appleton, 89 Columbia st., Albany, N. Y.

R. H. HOFHEINZ, *Pres.*,
Rochester, N. Y.

W. A. WHITE, *Sec'y*,
Phelps, N. Y.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

At the regular meeting of the First District Dental Society of the State of New York, to be held Tuesday evening, March 8, 1904, at the Academy of Medicine, 17 West Forty-third street, New York city, a paper will be read by Dr. R. R. Andrews of Cambridge, Mass. Subject: "Calco-Globulin, and the Part It Plays in the Formation of the Dental Tissues in Health and Disease." The discussion will be opened by Prof. J. Bethune Stein of New York.

B. C. NASH, *Sec'y*.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE fortieth annual convention of the Connecticut State Dental Association will be held at Hartford, Conn., on Tuesday and Wednesday, April 19 and 20, 1904.

FREDERICK HINDSLEY, *Sec'y*, Bridgeport, Conn.

MASSACHUSETTS DENTAL SOCIETY.

THE fortieth annual meeting of the Massachusetts Dental Society will be held in the Massachusetts Charitable Mechanic Association Building, Huntington ave., Boston, Mass., June 1 and 2, 1904.

EDGAR O. KINSMAN, *Sec'y*,
15 Brattle Sq., Cambridge, Mass.

VERMONT STATE DENTAL SOCIETY.

THE twenty-eighth annual meeting of the Vermont State Dental Society will be held at Hotel Pavilion, Montpelier, March 16, 17, and 18, 1904. We anticipate a pleasant as well as a profitable meeting, and a cordial invitation is extended to all.

THOMAS MOUND, *Sec'y*, Rutland, Vt.

NEW JERSEY STATE DENTAL SOCIETY.

THE New Jersey State Dental Society will hold its annual convention in the Auditorium, at Asbury Park, N. J., July 21 to 23, 1904.

Intending exhibitors should apply direct to the chairman of the Exhibit Committee,

Dr. W. G. CHASE, Princeton, N. J.

EASTERN DENTAL SOCIETY OF NEW YORK CITY.

THE twenty-fifth regular monthly meeting of the Eastern Dental Society was held on Thursday, February 4, 1904, with an exceedingly large attendance. The paper of the evening was read by Dr. C. S. McNeille, on "Practical Points in Extraction." The paper was well received and freely discussed.

The next regular monthly meeting will be held on March 3, 1904, at the new quarters of the society, Clinton Hall, Clinton street near Grand.

JOS. SOOKNE, *Sec'y*.

NEW YORK COLLEGE OF DENTISTRY.

REUNION—CLASS OF '95.

THE regular annual reunion of the class of '95, New York College of Dentistry, will be held Saturday evening, April 16, 1904. Members of the classes of '94 and '96 are cordially invited to participate.

Full particulars will be sent to all members of these classes sending their addresses to

F. C. BRUSH, *Chairman*,
1183 Broadway, N. Y.

ALABAMA DENTAL ASSOCIATION.

THE Alabama Dental Association will hold its next annual meeting in Anniston, Ala., beginning on the second Tuesday in May, 1904.

L. A. CRUMLY, *Sec'y*,
First Nat'l Bank B'd'g, Birmingham, Ala.

FLORIDA STATE DENTAL SOCIETY.

THE twenty-first annual meeting of the Florida State Dental Society will be held at Atlantic Beach, May 25, 1904.

J. EDWARD CHACE, *President*,
D. D. BECKMAN, *Sec'y*.

INDIANA DENTAL ASSOCIATION.

THE Indiana Dental Association will meet in Indianapolis, Ind., June 14, 15, and 16, 1904. A fine meeting is expected.

A. T. WHITE, *Sec'y*, New Castle, Ind.

UTAH DENTAL ASSOCIATION.

THE Utah Dental Association will hold its eleventh annual meeting and clinic in Salt Lake City on April 8 and 9, 1904. A cordial invitation is extended to all ethical practitioners of the dental profession to attend.

S. W. WHERRY, *Sec'y*, Ogden, Utah.

MINNESOTA STATE DENTAL ASSOCIATION.

THE twenty-first annual meeting of the Minnesota State Dental Association will be held in St. Paul, June 16, 17, and 18, 1904.

GEO. S. TODD, *Sec'y*, Lake City, Minn.

KENTUCKY STATE DENTAL ASSOCIATION.

THE coming annual meeting of the Kentucky State Dental Association promises a dental convention of unusual interest. To be held in Louisville, May 17, 18 and 19, 1904.

Members of the profession are extended a hearty welcome.

W. M. RANDALL, *Sec'y*,
Masonic Building, Louisville, Ky.

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association will hold its twenty-fourth annual session at Corsicana, Texas, May 5, 6, and 7, 1904.

All ethical members of the profession are invited to meet with us.

BUSH JONES, *Sec'y*,
Dallas, Texas.

TEXAS BOARD OF DENTAL EXAMINERS.

THE Texas State Board of Dental Examiners will hold its next examination in Corsicana, Texas, beginning on May 9, 1904, at 10 A.M.

For further information address

C. C. WEAVER, *Sec'y*, Hillsboro, Texas.

MINNESOTA BOARD OF DENTAL EXAMINERS.

THE Minnesota State Board of Dental Examiners will meet for the purpose of examining applicants for license on April 5, 6, and 7, 1904. No application received after 12 M., April 5th.

Meeting held at dental department of State University at Minneapolis.

C. H. ROBINSON, *Sec'y*,
Wabasha, Minn.

CALIFORNIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of California will hold its next examination in San Francisco, commencing on May 23, 1904, and will also hold an examination in Los Angeles, commencing on June 13, 1904.

F. G. BAIRD, *Sec'y*.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their annual meeting in the Coliseum building, corner Thirteenth and Olive streets, St. Louis, Mo., on the 25th, 26th, and 27th of August, beginning promptly at 10 A.M.

Telephone and telegraph offices in the building. Hotel accommodations will be secured for the members.

CHAS. A. MEEKER, *Sec'y and Treas.*

NOTICE TO MEMBERS OF THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS

It will be necessary for the secretaries of all those members of the National Association of Dental Examiners who desire copies of the proceedings of the meeting held in 1903 at

Asheville, N. C., to send in their names and addresses to the undersigned.

The secretary does not possess occult powers and but nineteen states have responded as the result of two notices in the journals during the foregoing year.

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

MASSACHUSETTS BOARD OF REGISTRATION.

THE next meeting of the Massachusetts Board of Registration in Dentistry for the examination of applicants will be held in Boston, on March 9, 10, and 11, 1904.

Application blanks and all necessary information furnished by the secretary.

G. E. MITCHELL, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JANUARY 1904.

January 5.

No. 748,977, to FREDERICK H. NEIS. Rubber dam clamp.

January 12.

No. 749,624, to PIERCY B. McCULLOUGH. Dental bur.

January 19.

No. 749,846, to HENRY L. CRUTTENDEN. Cement injecting tube.

No. 749,881, to FINIS E. ROACH. Thumb support and root-brace for enamel cleavers.

No. 749,899, to HENRY H. GANTZ. Sprayer for dental polishing and grinding instruments.

No. 750,038, to MILTON H. SHOENBERG. Attenuating device.

No. 750,203, to LEWIS KNIGHT. Dental articulator.

January 26.

No. 750,615, to WILBER M. DAILEY. Dental appliance.

No. 750,639, to JOHN C. GRAFT. Method of manufacturing attrition disks and the product thereof.

No. 750,695, to ANDREW J. PRICE. Rubber dam holder.



very truly Otis Avery

THE DENTAL COSMOS.

VOL. XLVI.

APRIL 1904.

No. 4.

ORIGINAL COMMUNICATIONS.

SOME DEGENERATIONS AND THEIR SIGNIFICANCE.

By A. HOPEWELL-SMITH, M.R.C.S., L.R.C.P., L.D.S., Eng.,

LECTURER ON DENTAL ANATOMY AND PHYSIOLOGY AND PRACTICAL DENTAL HISTOLOGY, AND ASSISTANT
DENTAL SURGEON, ROYAL DENTAL HOSPITAL OF LONDON.

INTRODUCTION.

IT is proposed in this and the succeeding communication to put on record and publish for the first time some observations accompanied by original photomicrographs of what are believed to be unique and hitherto unknown examples of certain degenerative conditions taking place in those soft parts which are so intimately associated with the human teeth. The first paper deals with degenerations of the periodontal membrane, the second with degenerations of the epithelium of the oral cavity. The former condition is of fairly common occurrence, the latter extremely rare. The one closely corresponds with a similar affection of the dental pulp, the other probably stands quite alone in the history of the pathology and pathohistology of the skin and mucous membranes.

DEGENERATION OF THE ALVEOLO-DENTAL PERIOSTEUM.

It would seem, *prima facie*, to be a matter of surprise that the periodontal

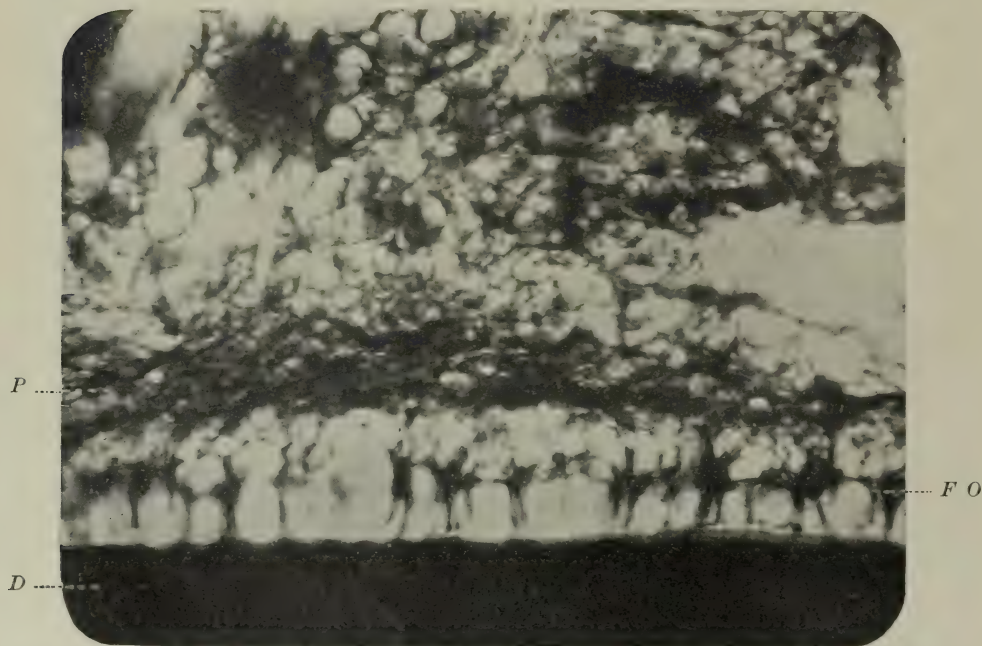
membrane—that thin, structurally insignificant and uninteresting delicate periosteum or ligament that covers the roots of the teeth of man—should ever present many or even any pathological changes for examination by the dental surgeon or pathologist, or open up to him new fields for investigation and research, as macroscopically it appears so unimportant and so far beneath his serious contemplation. But second consideration reminds one that it is a fibrous tissue analogous, homologous, and practically identical both anatomically, physiologically, and pathologically with the periosteum of bones; and when this fact is recalled, and thoroughly recognized, it is not difficult to understand that, as a consequence of disturbances in or loss of the functional activity of its cellular fibrous elements, or as a result of certain metabolic processes occurring therein, it can and sometimes does undergo metamorphoses of disintegration or atrophy on the one hand, or abnormal forms of growth and proliferation on the other; and that incidental to these retrogressive

or progressive changes it may, almost as much as the periosteum of the jaws and long bones themselves, inflame, degenerate, or give origin to neoplasms of either a benign or a malignant nature.

Of the progressive transformations of this tissue little need here be said. Suffice it to remark that it has been abun-

protoplasm becomes converted by an abnormal intracellular metabolism indirectly into functionless but non-necrotic and non-irritating tissue, and actual death does not supervene, a form of degeneration of the parts is established. Thus fatty, colloid, mucoid, calcareous, or other degenerations are types of well-

FIG. 1.



Transverse section of fibroid degeneration of the pulp, cut *in situ*. Prepared by "fixing" and hardening in alcohol and formaldehyd, and decalcified by the author's method. Stained with Ehrlich's acid hematoxylin. (Magnified 170 diameters.) *D*, Dentin with tubules. *F O*, Fibroid odontoblasts. *P*, Atrophied pulp tissue.

dantly proved that, in addition to its liability to frequently inflame, there may arise in it, *de novo*, epithelial and myxomatous granulomata,¹ dental cysts,² periosteal hard fibromata,³ round-celled⁴ and myeloid sarcomata,⁵ and very rarely squamous carcinomata.⁶

Degeneration of an organ in general pathology usually implies a gradual retrogressive alteration in its component parts, brought about in the first instance in one or more various ways. If cellular

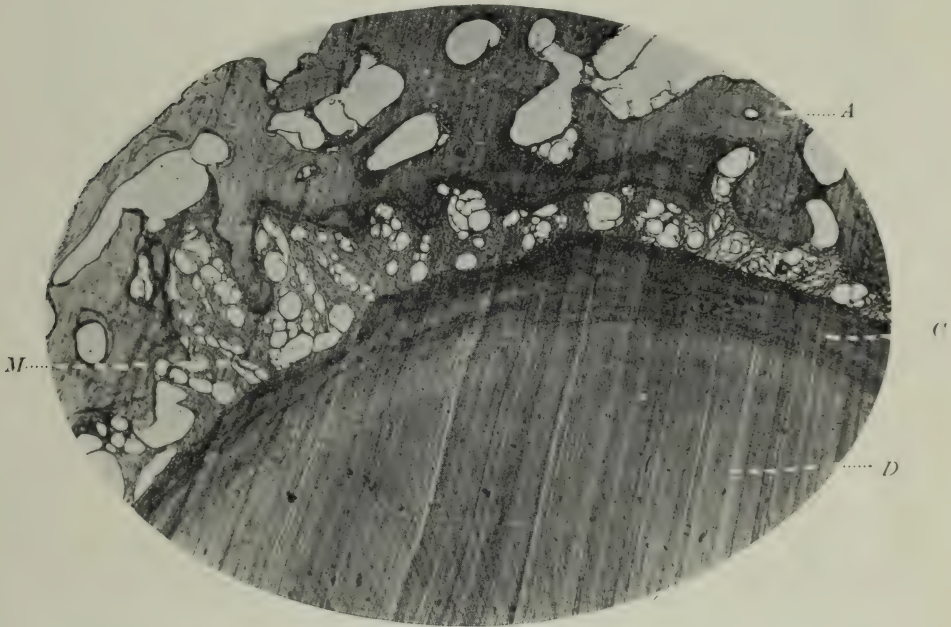
known changes induced by conversion of the protoplasm into several kinds of morbid and useless substances, and are often followed by cell-destruction; but the dental pulp, the periodontal membrane, and the soft parts found in the Haversian and medullary canals of neighboring bones, seem sometimes to be able to undergo degenerative atrophy on which neither necrobiosis nor necrosis can possibly follow.

The disease about to be described is of

the nature of a fibrosis or hyperplasia of the individual connective tissue fibers and cells of these soft organs—the precise clinical, histological, or pathological processes which have produced such results being, at present, very obscure and hard to trace. It is probably due to an exaggerated localized lack of nutrition induced by senile changes in the body generally—not a simple atrophy in which

Regarding this from a dental standpoint, these peculiar anatomical relationships obtain only in the mouth and jaws: in the first instance the pulp inclosed in its dentinal environment, in the second the root-membrane limited by cementum internally and by alveolar bone externally, and again the medullary tissues surrounded so securely by the concentric lamellæ of the Haversian systems of the

FIG. 2.



Transverse section of fibroid degeneration of the alveolo-dental periosteum, cut *in situ*. Prepared and stained as in preceding figure. (Magnified 50 diameters.) *D*, Dentin. *C*, Cementum. *A*, Alveolus. *M*, Atrophied root-membrane.

there is a decrease in the size or number of cells or fibers, but a degenerative or marantic⁷ or senile condition where the protoplasm and the nuclei of the cells are altered completely.

Descriptions of fibroid degeneration are not generally found in text-books of pathology, and this probably can be accounted for by the fact that it seems to be limited chiefly to those vascular structures which are situated within or between hard osseous, unyielding walls.

alveolar processes of the maxillary and mandibular bones. In this manner the omission may be explained, but that the conditions represented by the term "fibroid degeneration" do exist there is no possible doubt whatever.

The present author in 1892 drew attention to a frequent degeneration of the dental pulp⁸ which on comparison with the similar condition of the periodontal membrane bears a curious, interesting, and instructive resemblance to the latter.

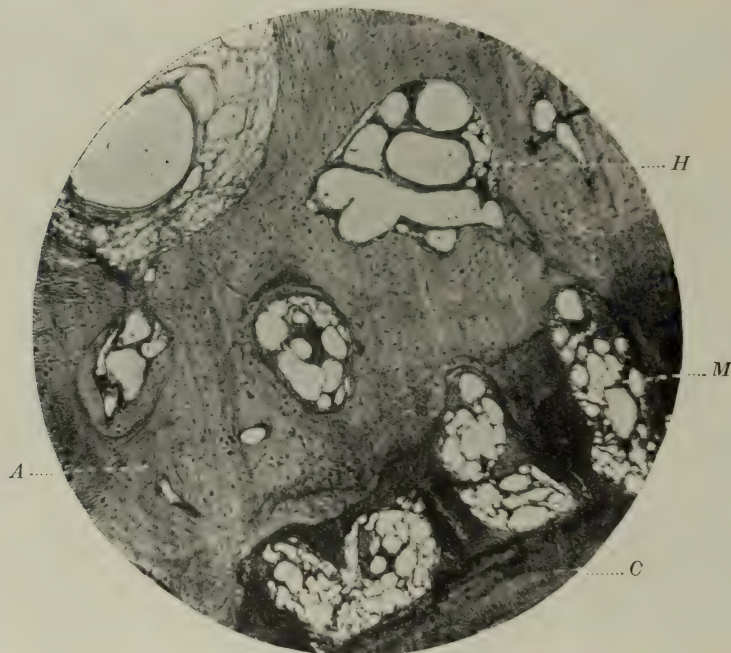
A casual glance at Figs. 1 and 4 shows that fibroid degeneration of both are almost homeomorphous. A reference to the etiology and patho-histology of the former will throw some light on the clinical and pathological histories of the latter.

Briefly, it may be mentioned that

lation and edema described by Black,⁹ the reticular atrophy of Wedl,¹⁰ and the "Atrophia pulpæ scleroticans" of Rothmann.¹¹

But in complete fibroid degenerations there are no cells of any description, no nuclei, no odontoblasts, no nerve fasciculi, and no bloodvessels; while the con-

FIG. 3.



Transverse section of the same. Prepared as in Fig. 1. Stained with hematoxylin and counterstained with warm ammonia-picro-carmin. (Magnified 120 diameters.) C, Cementum. M, Root-membrane. A, Alveolus. H, Enlarged (osteoporotic) Haversian canals.

fibrosis of the pulp is simply a "natural old-age termination of the life of a healthy pulp" which has survived any attacks of an endogenetic or exogenetic character. It is not dependent, in the least degree, on inflammation of that organ, but attendant on senile marantic constitutional changes. Several writers in America and on the continent of Europe have described certain affections which may be allied to or even be precursors of this fibrosis, notably the areo-

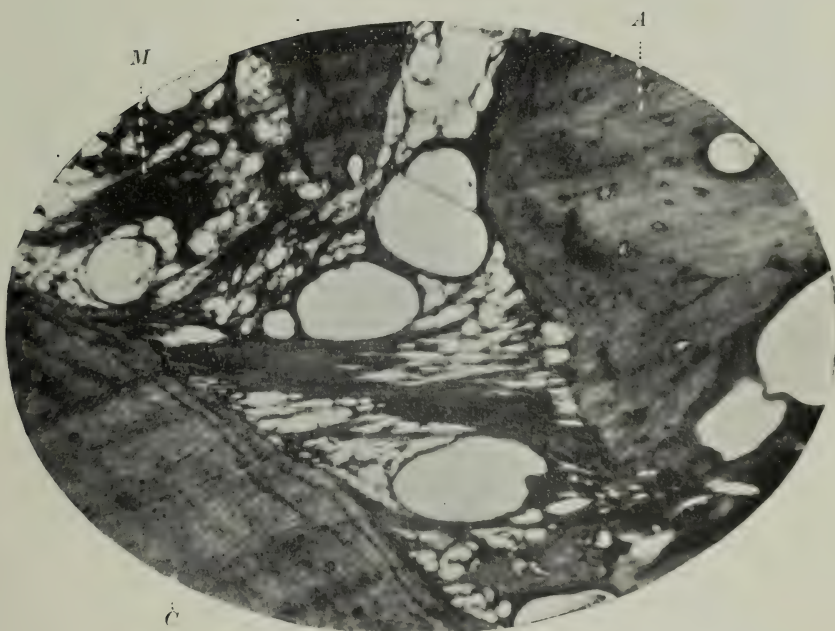
nective tissue, "which is but a loose mass of network in the normal state, has become grossly hypertrophied or quite obliterated, and its place taken by a new, firm, fibrous structure devoid of cells, nuclei, or any regular arrangement of constituent parts."¹²

There is therefore a remarkable coincidence in the microscopical characteristics of complete fibrification of the pulp and the root-membrane; but there are two important differences. One is that,

FIG. 4.



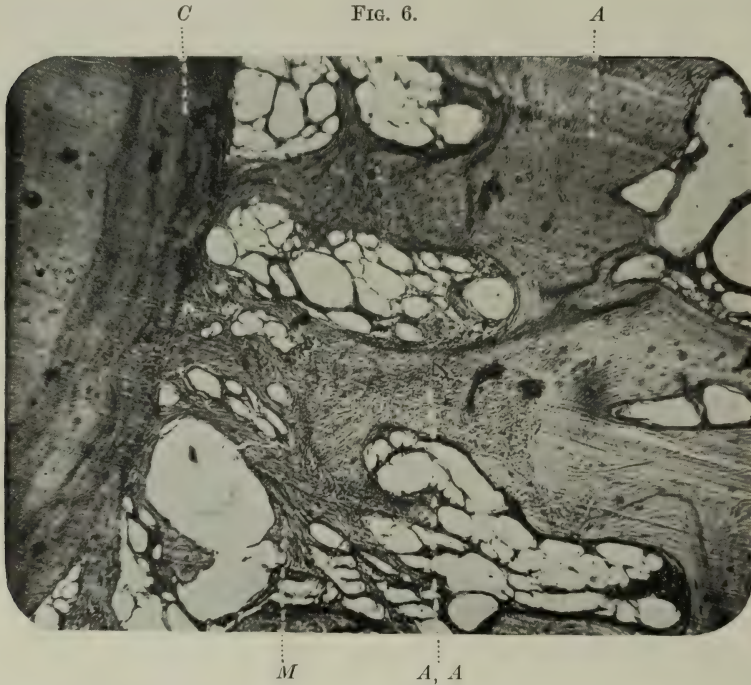
FIG. 5.



Figs. 4 and 5: Transverse sections of the same. Prepared similarly. Stained with iron perchlorid and tannic acid. (Magnified 260 diameters.) C, Cementum. A, Alveolus. M, Root-membrane.

in the pulp, the whole of the organ becomes simultaneously and perhaps suddenly metamorphosed, while in the alveolo-dental periosteum, and in a lesser degree in the spaces of the osteoporos alveolar bone, the changes which lead up to a perfect fibrosis can be observed taking place side by side within the same area; the other, that whereas fibrosis of

elderly people often reveals, associated with absorption of the alveolar processes of the jaws, the presence of sound but aged and yellow teeth, portions of whose roots are exposed. The gum is shrunken, the cementum laid bare, and the periosteum gone. The teeth may be very loose or fairly firm, free from pain or afflicted with a subacute periostitis as the result



Transverse section of the same. Prepared as before. Stained with hematoxylin. (Magnified 160 diameters.) C, Cementum. M, Root-membrane. A, Alveolus. A, A, Structureless alveolus mentioned in the text.

the pulp affects only that tissue, that of the periodontal membrane affects not the cementum, but the bone of the socket, which in its turn shares the innutrition of the vascular periosteum. It may be remarked, however, that fibrosis of the pulp and the root-membrane and the soft tissue in the osteoporos bone may occur synchronously as a result of the general senile changes in the hard parts of the buccal cavity.

An examination of the mouths of

of sudden traumatism. Chemical or thermal stimuli yield no effect. If the alveolo-dental membrane of such teeth as these has never been subjected to disease, but has simply run its life-course and has now become atrophied, fibrosis has most likely occurred; and the microscopical study of such a membrane is rewarded by the discovery of certain new histological appearances which can now be described in fuller detail.

PATHO-HISTOLOGY.

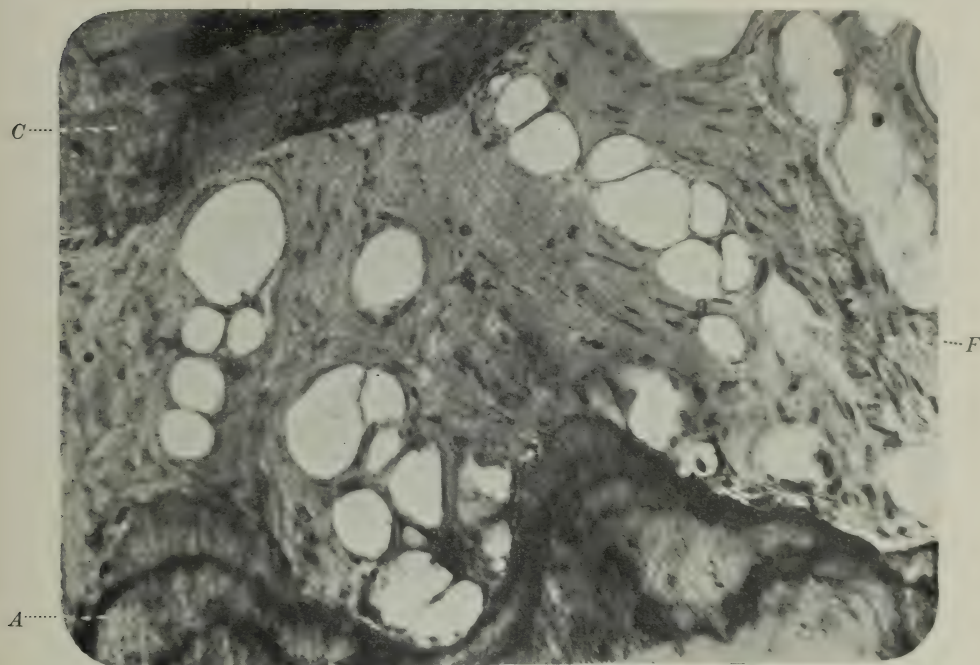
The Fibrous and Cellular Elements.

In places the fibers are thin and delicate at the edge of the cementum (Fig. 2), but as they unite to pass obliquely outward they increase in diameter and coarseness, here (Fig. 3) being thickly meshed together in broad long bundles or sheaves with but little branching;

of the enamel organ minus its cells, at the period when it is about to disappear.

As the thin fibers increase in size, it is seen that they are composed of fine strands running parallel with one another, until in places they may extend across the intervening space as thick shapeless masses separated from one another by areolæ of varying size and form. (Fig. 6.) They pass in a wavy direction similar to the undulating character of

FIG. 7.



Transverse section of the same. Preparation and staining similar. (Magnified 300 diameters.) C, Cementum. A, Alveolus. F, Fibers with decrepit nuclei.

there, more sparse and sending out inter-osculating branches. (Fig. 4.) Their attachment is very strong both externally and internally, and their free extremities seem to be "built into" the hard tissues. (Fig. 5.) The thinner fibers are structureless, possess clear double contours, and branch freely. A nucleus may, at times, be retained, but the reticular appearance of the thinnest fibers resembles, at a glance, the *stellate reticulum*

white connective-tissue fibers, and like them have fusiform, triangular or ovoid nuclei generally arranged in rows running parallel with the fibers themselves—that is, obliquely outward. (See Fig. 7.) The nuclei are apparently atrophied, and do not exhibit the nucleoli or the spongioplasm or the hyaloplasm found in the same fibers in a young periodontal membrane—facts well demonstrated when the sections are stained with

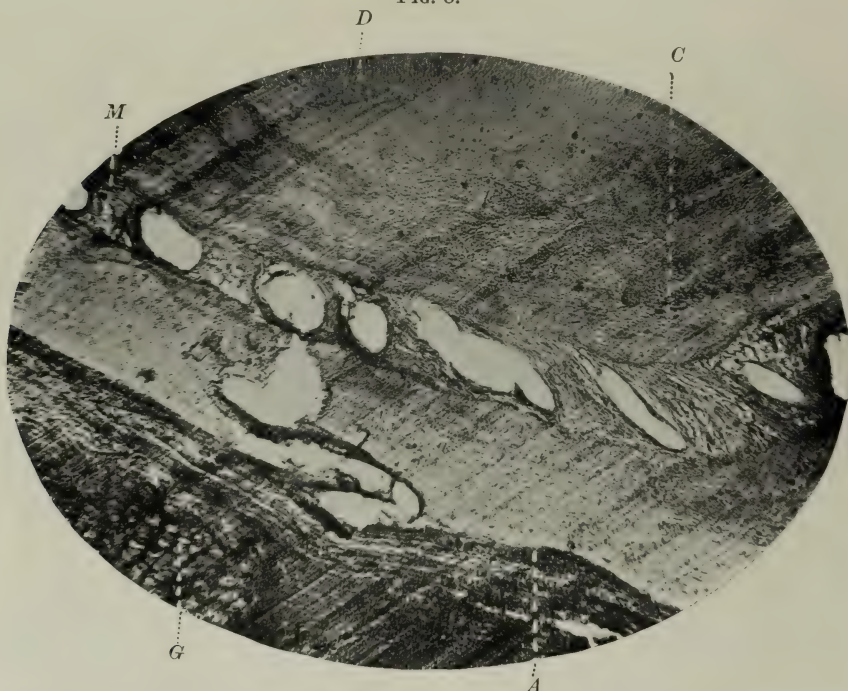
Ehrlich's acid hematoxylin followed by warm ammonia-picro-carmin (Squire's formula), as in Fig. 3.

These prominent aggregations of connective-tissue bundles are probably merely the atrophied remains of the "principal fibers" of Black.¹³

All traces of osteoblasts have vanished absolutely, a few decrepit nuclei alone

fibroid degeneration are the areolæ newly developed in the tissue. In many instances they extend right across the thickness—or rather the thinness—of the periodontal membrane. (See Figs. 2 and 8.) The larger ones measure 310 microns and more, the smaller 2 microns to 20 microns, the average being perhaps 60 microns.

FIG. 8.



Longitudinal section (apical region) of fibroid degeneration of the alveolo-dental periosteum. Preparation, staining, and magnification as in Fig. 6. D, Dentin. C, Cementum. A, Alveolus. M, Root-membrane. G, Gum tissue.

indicating their anatomical positions in the membrane; and there are no epithelial "rests" of Malassez. There may be a little granular detritus here and there, as also the appearance of fatty degeneration. But this latter most likely marks the commencement of the areolation already mentioned.

The Areolar Spaces.

Interesting as are these changes, the most striking point about sections of

They are found in great numbers, they vary in shape, being tubular, oval, or round, and they are bounded and supported by strong curved fibers which pass almost circularly around them. They are in no sense the remains of the blood-vessels, as they are not confined to the central zone of the membrane, which is the rule in normal conditions. In addition they do not possess the definite walls of arteries, veins, and capillaries. They are perhaps more marked and obtrusive in transverse than in longitudinal sec-

tions (Fig. 8). Distributed fairly evenly throughout the membrane, they extend into the recesses of the osteoporous alveolus.

The width between the alveolus and cementum is but little diminished, and differs thus from mere senile changes. (Figs. 9 and 10.) It measures in its thinnest portion about 150 microns. But

mal, is not hyperplastic, the majority of the sections cut by the author being free from lacunæ and canaliculi. (Figs. 2, 5, 7, and 13.)

The osteoporosis of the alveolus is very pronounced, and the enlarged Haversian canals are filled with a shrunken fibroid tissue of a character resembling that which is found between the "principal

FIG. 9.



Transverse section of the root-membrane of an aged tooth. Preparation, staining, and magnification as in Fig. 2. *D*, Dentin. *C*, Cementum. *M*, Root-membrane. *A*, Alveolus. Cf. cementum in Fig. 2.

it is a noticeable feature of these sections that the bays or recesses of the alveolar bone are more exaggerated—doubtless not through absorption, as in the case of old teeth affected by pyorrhea alveolaris (see Figs. 11 and 12), but on account of the general osteoporosis which has occurred.

Changes in the Neighborhood.

It is a noteworthy fact that the cementum, although slightly thicker than nor-

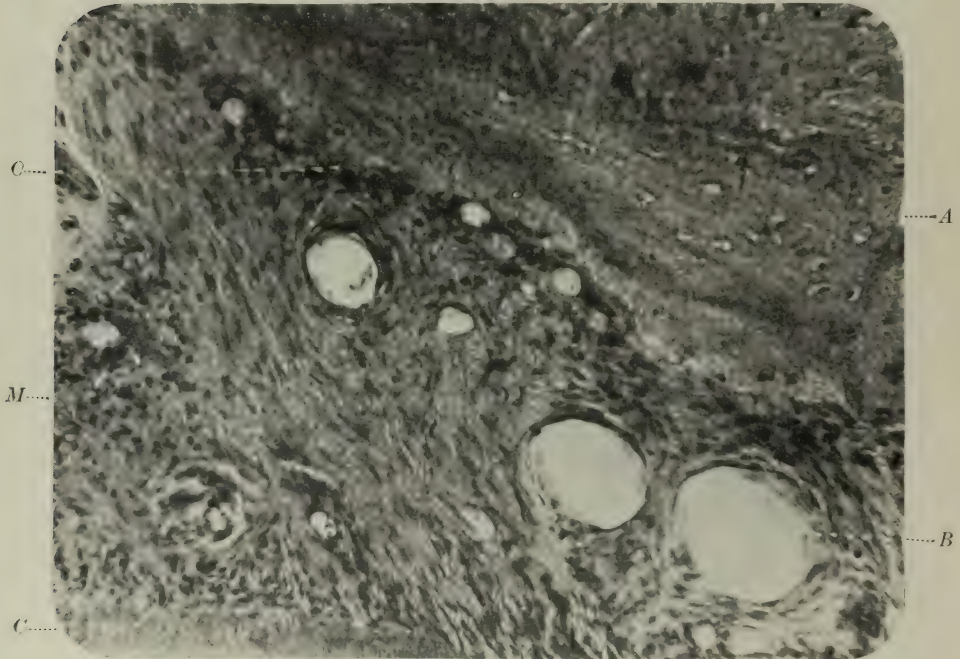
mal, is not hyperplastic, the majority of the sections cut by the author being free from lacunæ and canaliculi. (Fig. 14.) There are no red marrow cells, no myeloplaxes, no connective-tissue fiber cells, no blood corpuscles—nothing but an innutritious non-typal reticulum of coarse and fine fiber bundles.

The lacunæ of the Haversian systems are generally speaking abrachiate; and that part of the bone itself which is

immediately contiguous to the periodontal membrane has undergone microscopical alteration and degeneration in which the structure of the concentric and intermediary lamellæ are not only masked, but in some instances entirely lost and unrecognizable. (See Fig. 6.)

It is only necessary to add that it becomes much attenuated both in its epithelial and sub-epithelial portions, more coarsely fibrous and less vascularized than usual, and may, wholly or in part, undergo fatty, fibroid, or other old-age changes.

FIG. 10.



Transverse section of periodontal membrane of the tooth with acute pyorrhea alveolaris, from the mouth of a man aged 71 years. Prepared and stained as above. (Magnified 260 diameters.) C, Cementum. A, Alveolus. M, Root-membrane. B, Bloodvessels. O, Osteoblasts.

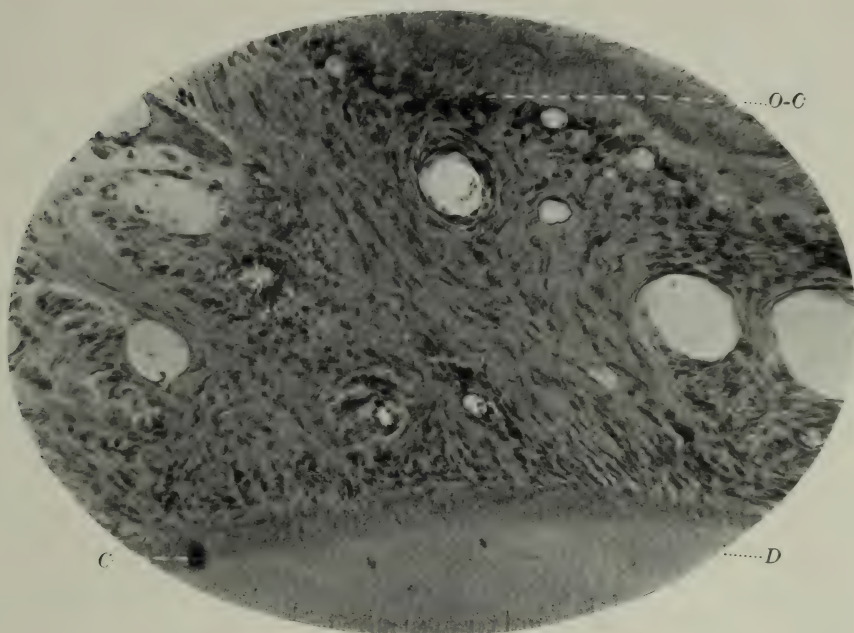
There is no calcification of any of the parts of the root-membrane, no progressive ossification or osteoplastic signs, no attempts at ankylosis; everything points to retrogressive changes pure and simple.

It would be indeed surprising if, all the other soft tissues degenerating as has been seen, the gum in the immediate vicinity should escape. It does not, but partakes, in its turn, of the general effects of the loss of nutrition. (Fig. 8.)

THE SIGNIFICANCE OF SENILE ATROPHY OF THE PERIODONTAL MEMBRANE.

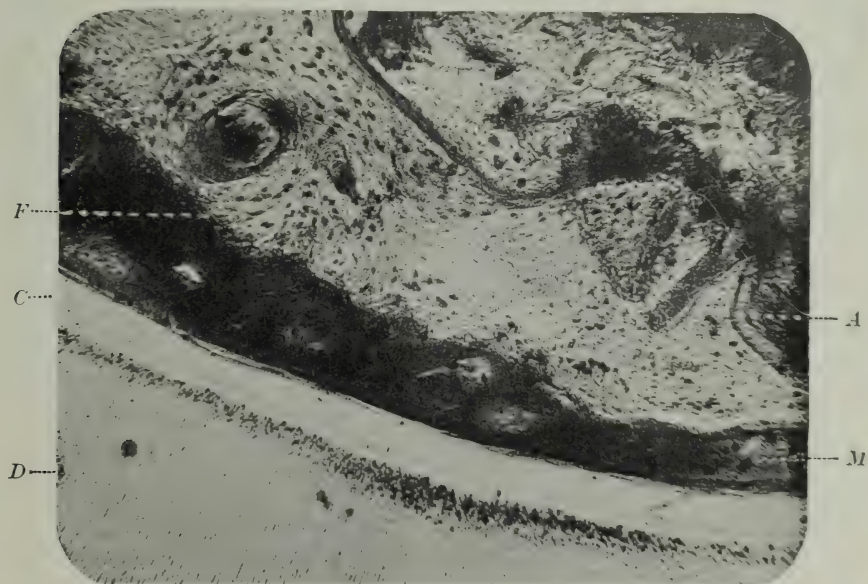
The clinical instruction derived from a diagnosis of fibrosis of the root-membrane is not difficult to determine. When a tooth depends on such an effete fibrous gomphosis as that described, for its stability and usefulness in the mouth, being only retained *in situ* by weak bundles of atrophied fibers, it is obvious that all reparative or therapeutic measures can be

FIG. 11.



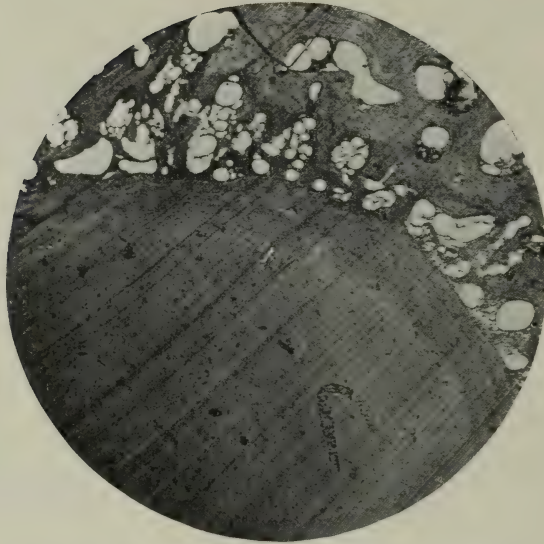
Same as Fig. 10. (Magnified 220 diameters.) *C*, Structureless cementum. *D*, Dentin. *O-C*, Osteoclasts.

FIG. 12.



Same, prepared by Weil's balsam method. (Magnified 120 diameters.) *D*, Dentin. *C*, Structureless cementum. *M*, Root-membrane. *A*, Osteoporous alveolus. *F*, Howship's foveolæ, produced by absorption by means of the osteoclasts.

FIG. 13.



Transverse section of fibroid degeneration of the alveolo-dental periosteum. Prepared as in Fig. 2. Stained with iron perchlorid and tannic acid. (Magnified 50 diameters.) Shows the general appearance of the tissue.

FIG. 14.



Osteoporous alveolar bone. Prepared as in Fig. 2. Stained with hematoxylin. (Magnified 250 diameters.) *C*, Concentric lamellæ. *I*, Intermediary lamellæ. *H*, Enlarged Haversian canal or cancellous space. *F*, Fibroid degeneration of the medullary tissue. *B*, Atrophy of artery (?).

of no avail. It would therefore be unwise to crown such a tooth, or to utilize its position in the alveolus as a buttress for a mechanical appliance of any kind or shape.

Although an aged periodontal membrane would not at this last phase of its life-history be at all likely to undergo inflammation, organization, or suppuration, or become gangrenous, it might very easily as a "point of irritation" in the jaw induce an obscure form of neuralgia or osteodynia, and it might become infected bacterially from its shrunken gingival margin. If this did occur, it is quite conceivable that pyogenic micro-organisms passing freely through the osteoporuous or cancellous tissue to the antrum or facial bones, might in certain circumstances thus become a source of spontaneous diffuse infective or septic osteomyelitis or chronic osteitis, leading perhaps to necrosis or the production of hyperostoses of the jaws.

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TWO ORTHODONTIA CASES.

By GEORGE T. BAKER, D.D.S., Boston, Mass.

(Table clinic given at the ninth annual meeting of the Northeastern Dental Association, Boston, Mass., October 21, 1903.)

CASE No. 1.—*Protrusion of upper, retraction and elongation of lower teeth.*

This is the case of a boy eleven and one-half years old. At birth he weighed only two pounds, was always delicate in health and with small, undeveloped maxillæ. A "mouth-breather." He was operated upon at six years of age for adenoids and hypertrophied tonsils. The surgeon noted at that time, "Very poor teeth." He had had scarlatina a year previous. He had a habit of wrapping his thumb in a small quilt and resting it against his lower teeth at night. The mother thought this a very nice thing, as "It kept his throat warm and pre-

vented croup"—not dreaming that the slight pressure, long continued, was gradually producing a deformity of teeth and jaws.

The case was first seen when he was ten and one-half years of age. The permanent teeth were then all in position except the upper and lower second and third molars and upper canines. (Fig. 1, A.) Operations were deferred until the upper temporary canines were shed and the permanent canines were observed just beginning to erupt. The patient was then eleven and one-half years of age.

The upper first molars were first banded, using German silver plate No. 33 gage, to which were soldered tubes one-half

inch long to prevent the expanding arch wire from riding up on the gums when

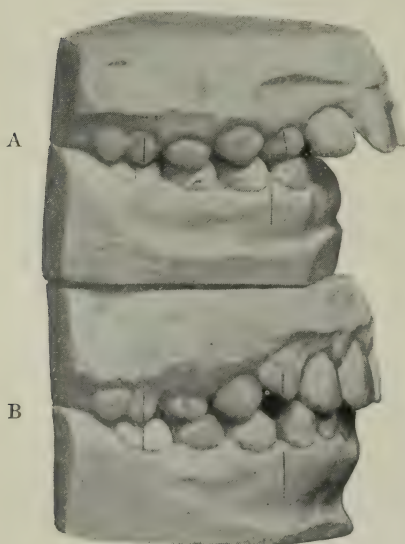
manner, using shorter tubes, and the arch wire was passed through them around the

FIG. 1.



pressure was applied to draw back the incisors. This was done by turning nuts

FIG. 2.



lower incisors labially, to which it was ligated, and forward pressure was secured by turning nuts in this case on the mesial (anterior) ends of the tubes. Both arch wires were made of German silver 18 per cent., No. 16 drawn from No. 14, to secure the right degree of stiffness and elasticity. Thus the upper incisors were drawn back and the lower incisors forced outward. In about six weeks the condition of the teeth was as represented by Fig. 1, B.

It is to be observed that in addition to the change of position of the upper incisors, the erupting canines were spread and forced outward, and it is obvious that this latter movement could not have been so nicely effected had pressure been brought to bear at any other time than when the canines were just beginning to erupt.

The side view of the teeth before operation is shown by Fig. 2, A, and after operation by Fig. 2, B.

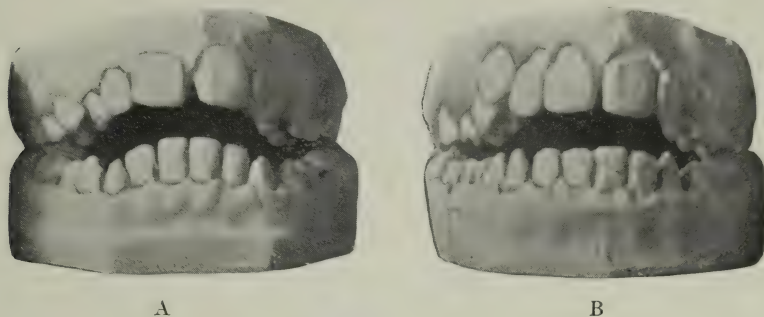
At this time it was observed that the lower incisors were still somewhat elongated, as shown by Fig. 3, A. To correct this (and at same time retain the upper incisors in their new position) a platform plate of rubber was made covering the

on the arch wire which passed through the tubes, the nuts being on the distal (posterior) ends of the tubes. The lower first bicusps were banded in a similar

roof of the mouth, with platinized gold wire No. 20 gage imbedded, emerging distally to the laterals and running in front of the incisors. This plate was thick enough just behind the incisors to slightly open the bite, depressions being

was bent at each end and soldered, forming loops which tightly encircled the lower temporary canines. These loops were passed over the canines (not cemented), allowing the band to pass in front of lower incisors pressing closely

FIG. 3.

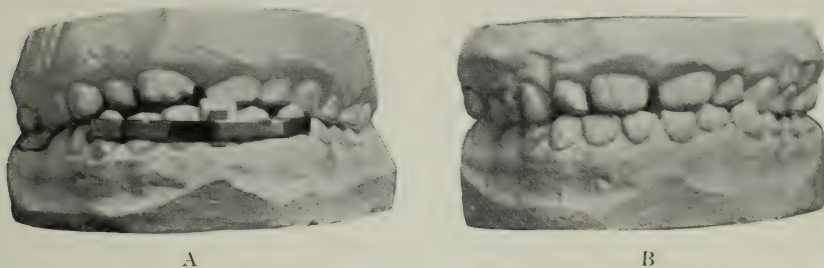


cut in which the lower incisors occluded. This depressed the lower incisors and allowed the bicusps to elongate, at the same time retaining the upper incisors.

After being worn about six weeks the condition is shown by Fig. 3, B. (The figure represents the teeth slightly open to show the depression of the lower in-

cisors.) Pressure was thus brought against the prominent lower left central incisor. A small piece of dry soft pine between the tooth and the band, changed frequently, forced the lower incisor backward (lingually). When well behind the maloccluded upper central, the band was removed and the lower

FIG. 4.



cisors.) This platform plate is still being worn until the second permanent molars shall have erupted, when occlusion will be locked permanently.

CASE No. 2. A girl aged six and one-half years. The upper left central incisor had erupted inside of the lower left incisor (both permanent teeth), which was somewhat prominent. This case was corrected in five days by a unique method. Ignoring the maloccluded upper central, a band of German silver about one-eighth of an inch wide and No. 33 gage

incisor in seeking its former position forced the upper central before it, and thus both teeth were quickly and easily brought into correct position.

Fig. 4, A, represents the teeth with the band in position. Fig. 4, B, represents the teeth five days afterward.

No retaining apparatus was worn, as the teeth interlocked sufficiently to secure them in their new position, and the girl, now a young lady, has as fine and regular a set of teeth as one would find in a day's journey.

THE AVOIDANCE OF OPACITY IN PORCELAIN INLAYS, AND THE USE OF OIL COLORS IN PORCELAIN WORK GENERALLY.

By Mr. ROBERT BREWSTER, Chicago, Ill.

(Read before the Seventh and Eighth District Dental Societies of the State of New York, at their annual union convention at Rochester, October 28, 1903.)

THE avoidance of opacity in inlays is the subject for consideration in this paper. Avoidance of opacity means, in other words, producing in the finished inlay the translucency and life-like appearance present in natural teeth.

Were it not for the fact that very close imitations of nature are being constantly obtained by those expert in the art, the problem of matching lost tooth-structure with a mineral compound, such as porcelain, would seem to be almost insurmountable.

For the purpose of this paper, porcelain restorations or fillings may be divided into three classes:

- (1) Labial cavities near the cervical.
- (2) Labial cavities involving the mesial or distal surface, and including the incisal edge.
- (3) Cavities in posterior teeth.

In the first class the cavities are usually confined to that portion of the tooth which has one shade only running through it, and when the cavity is cut deep enough to allow of a sufficient body of porcelain, satisfactory color results are usually obtained, especially if the approximal surfaces are not involved. In the third class named the coloring need not be so exact; and in any case, from the nature of the cavities, the desired object is more easy of accomplishment than in many other positions.

The second class, involving the mesio-incisal or disto-incisal angles of the incisors, presents the greatest difficulty. It

is in this class of cavity where most failures in accurate coloring occur, and it is just in this position, also, that imperfect work is most readily recognized by the laity.

A close study of the subject indicates that as we have proper material with which to accomplish our purpose, our inability to do so must lie in all cases in faulty manipulation. The correctness of this view largely agrees with the experience of those well versed in porcelain work.

Filling teeth with porcelain would appear at first sight to be a simple proposition; and if, after the technique of cavity preparation, contouring, and baking is mastered, we are content to rest, then it is a simple proposition; but we are liable to the criticism of the country practitioner who, when asked his opinion on porcelain *versus* gold, said he "would as soon see gold in a front tooth as a porcelain patch." Now, it is the avoidance of this very appearance indicated in the criticism that gives us the most concern.

A longitudinal section of a central incisor shows us that where the dentin is thickest the enamel upon its labial surface is thinnest, and as the cutting edge is approached the enamel becomes thicker, until at the extreme incisal edge, unless removed by abrasion, nothing but enamel is found.

In an ordinary (clean) yellow tooth the density of its color at the cervical is due to the thickness of the tooth at

that point; as the tooth gets thinner, at about the middle third, the color lightens, and between this portion and the extreme cutting edge several shades of color may be detected, ranging from the lighter yellow into a light blue, or bluish-green, the intensity of this semi-transparent color at the extreme cutting edge being dependent upon the thickness of the enamel plates.

It is obviously impossible, with a single color body—however near it may appear to match the tooth as a whole—to represent the various shades found in the lower two-thirds of a tooth such as described. The difficulty is further increased by the different degrees of translucency met with in different teeth. To obtain the lifelike appearance desired in the class of filling under consideration it has been found necessary to have at least two bodies, and in many cases three.

The foundation body is necessary to obtain rigidity in the matrix and to give a basal color; the enamel body to give the correct color and form for the body of the inlay, and the XX body to increase the enamel effect. The value of this third body is very noticeable on approximal surfaces, when a considerable amount of transparency of the outer surface is required to correspond with that on adjoining teeth, and particularly well does it represent enamel at the extreme cutting edges. Now, each of these bodies has a quality peculiarly its own. They have been made to do certain work, and no one of the three will take the place of the other.

Very considerable experimental work was undertaken before the correct combination of minerals was discovered which has given, under proper treatment, such admirable results as are frequently met with.

The method of using these bodies is also an important feature. Dr. W. T. Reeves was probably the first man to adopt the plan of laying the enamel colors one upon another, and of baking each layer separately. By this method he found he was able to shade an inlay and break up that monotony of color common to the use of a single color body.

He was also the first to suggest the value of primary colors in inlays, a feature of the work to which reference will be made later.

A great deal has been said about refraction, in endeavoring to explain some of the phenomena associated with inlays. This branch of physical optics, however, aids us but little; with the exception of the outer layer of transparent XX enamel, no part of a porcelain filling is sufficiently transparent to refract the rays of light. We must rather look to translucency (I use this term in the sense of semi-transparency) and reflection for an explanation.

Natural teeth vary in their translucency according to the density of the dentin, or rather the intensity of the coloring matter within the dentin. This variation is quite considerable, and forms one of the principal obstacles to successful reproduction in porcelain. It is sometimes difficult for beginners to determine, when approaching the thinner portion of the tooth, just how much of the denser foundation body should be left under the covering of the more translucent enamel body. Experience, however, soon clears away this difficulty.

To insure the necessary translucency in an inlay, it must be sufficiently fused. An underfused piece of porcelain is opaque, and gives the same effect as a ground surface. Light will not penetrate it so readily; neither will light be reflected from it to the same extent; but here it becomes necessary to give a word of caution in the use of the XX enamel. An insufficiently baked piece of porcelain, in which the color has not been brought out, is not improved materially by the addition of the XX; the improvement is but partial. An inlay to match the tooth in color must be composed throughout of properly fused and properly prepared porcelain, the darker shades of body lying some distance below the surface.

In addition to what can be done with the various shades of enamel body toward meeting those cases of irregularly shaded teeth, those with brown stains or opaque white spots, etc., recourse may be had to

high-fusing oil colors. These may be applied to the outer surface of an inlay (of course before removing the platina matrix) and its color entirely changed, as I hope to show you in my clinic tomorrow. But for producing stains in an inlay to correspond with similar markings in the tooth, the color must be painted on the layer lying immediately below the outer one, through which it will be reflected.

The mention of reflection brings us to an important feature of the subject, viz, the effect of cement in changing the color of inlays.

If the cement were transparent it

would offer no resistance to the passage of light through the tooth, neither would it absorb the rays of light as our present opaque cement does. My experiments so far on this subject lead me to the conclusion that, to overcome this tendency of cement, the foundation body or lining to our matrix must be of a bright reflecting character; something dense enough to counteract the absorbing effect of the cement and yet bright enough to reflect the rays back through the inlay.

The principle involved is to restore artificially the reflecting property of the dentin by overcoming the well-known action of cement to absorb light rays.

DENTAL ART AMONG THE ROMANS AND ETRUSCANS.

By Dr. VINCENZO GUERINI, Naples, Italy.

(Read before the Section on Odontology and Stomatology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

THE historical references which I propose to expound in this paper will, I trust, clearly show the antiquity of dentistry in Italy, and furthermore will, I believe, clearly demonstrate that in the most remote times dentistry was practiced mainly by specialists having no connection with the medical profession.

We find evidences of the antiquity of dentistry in the Latin literature and in the archæological works and discoveries pertaining to that epoch.

In a very ancient law promulgated 303 years after the foundation of Rome—namely, 450 B. C.—a paragraph is found wherein mention is made of teeth tied with gold. It seems almost unnecessary to recall that in the Twelve Tables a law was incorporated forbidding the interment or cremation of bodies having gold objects attached to them, and that a proviso was instituted

excepting those bodies in which the gold had been used to ligate the teeth; these were permitted to be buried with their gold appliances.

At that remote epoch no physicians were to be found in Rome, and Pliny, the celebrated author, tells us that for several centuries the Romans had no physicians and that the first one to practice there was Archagathus, a Greek, who went there in the sixth century after the foundation of Rome, at an epoch prior to the promulgation of the Twelve Tables. It is therefore evident that operations upon the teeth were practiced at Rome long before any other branch of the healing art. It is questionable and doubtful whether the ligatures to which reference is made in the Twelve Tables were used to support artificial teeth or to retain loose and diseased organs. We do not possess sufficient historical data to definitely settle

this question, but it is probable that the insertion of artificial teeth was already in vogue at that period among the Romans, as the Etruscans, their neighbors, had been practicing this branch of dentistry many years prior to the promulgation of the law in which allusion is made to gold ligatures about the teeth.

It is, however, without any doubt true that prosthesis was practiced in Rome a few centuries later. Horace, who lived between 65 and 8 B. C., depicts in one of his satires two sorceresses, Sagana and Canidia, the former as wearing a wig and the latter false teeth. Martial, the epigrammatic poet, who flourished in the following century, mentions artificial teeth in several of his epigrams. In one of these poems he speaks of the courtesan *Ægle* as having teeth of bone and ivory. In another epigram he praises the beauty of *Lecania's* teeth, "white as the snow," but he farther on remarks that they were not her own. Besides these epigrams, and various others which we have not mentioned and which remove all element of doubt from the assertion that dental prosthesis was already employed at that period, there remains one to be cited in which Martial in an effusive criticism of a courtesan of mature years, tells her, "Your teeth, as your gown, you nightly remove."

The previous paragraph is one from which a valuable conclusion might be drawn, namely, that at an epoch so remote, dentures were already made of the removable type that were used in the daytime and removed upon retiring. These appliances, which according to Martial's description could be removed as easily as a robe, must have been made carefully and accurately.

This apparent state of progress in prosthetic art is really not surprising considering that at the time in which Martial lived dentistry had already been known in Italy for a long time. The Etruscans, whose civilization was older than that of the Romans, had practiced prosthetic dentistry at an epoch decidedly remote. Proofs in support of this belief are embodied in the different prosthetic

pieces unearthed from several Etruscan necropolises and stored in various Italian museums, particularly at the Civic Museum of Corneto, at the Museum of Count Bruschi in the same city, and at the Museum of Pope Julius at Rome. The Etruscan necropolises in which prosthetic appliances have been found belong to a very ancient period, as archæologists have traced them back to five or six centuries before the Christian era.

A careful examination of some of these appliances will reveal the astounding fact that Etruscan dentists twenty-five centuries ago were familiar with a certain variety of bridge work. It should be remembered that the Etruscans lost their identity as an independent nation about three hundred years B. C. Etruria corresponds to the present Tuscany, and when the Etruscans were conquered and became subjects of the Romans their civilization was consequently absorbed by the victors. Considering the riches and luxury which reigned at Rome, it is plausible to suppose that Etruscan dentists practiced their art in that city, as their services could have been there better remunerated. The dental art of the Etruscans must have necessarily exercised a marked influence upon Roman dentistry, and inasmuch as the Etruscans were very able prosthetists several centuries B. C. it is not particularly surprising that dentistry should have reached such a state of development at Rome at the time of Martial—that is, one thousand years after the time to which the prosthetic pieces found in the Etruscan necropolises are supposed to belong.

Latin literature furnishes us some valuable information from which we can conclude and affirm that prosthesis had reached a notable degree of perfection at Rome. Several years ago, in the course of my researches on dental archæology, an appliance was shown to me at the Museum of Pope Julius at Rome unknown up to that time to the public, and which had been found shortly before in the excavations of Satrium, near Rome. I was asked to express my opinion on the nature of the appliance, and

great was the emotion I felt when I realized that this ancient appliance before my eyes was a crown. "Crown work among the ancients!" Hence we are to-day in a position to affirm that not only did the Etruscans construct a certain kind of bridge, but likewise that the dentists of ancient Rome succeeded in making a type of crowns.

The appliance found in the excavations of Satricum, an exact reproduction of which may be seen in my archaeological collection, is thus constructed: Two swaged gold surfaces representing respectively the lingual and labial surfaces of a lower incisor are soldered together and thus constitute the crown. This crown was maintained in position by means of narrow bands of gold which encircled upon each side the two adjoining teeth, and soldered to the anterior and posterior part of the base of the crown. All the facts to which I have alluded demonstrate that not only did the Etruscans and the Romans practice dental prosthesis, but furthermore that they practiced it with ability and intelligence.

Notwithstanding that fact, however, the medical works of the ancients do not make any reference whatever to dental prosthesis. Neither Celsus nor Scribonius Largus, nor even the celebrated Galen, who wrote a medico-surgical encyclopedia, speak of dental prosthesis. It is therefore evident that dental prosthesis was not practiced by physicians, and that they considered it entirely without their sphere of action, and it seems that they did not even practice the extraction of teeth. Celsus considered this a very dangerous procedure, while five centuries prior Hippocrates thought it a very easy operation—one

that anybody could perform. We see from this that Hippocrates and Celsus differed very widely in their opinions on the extraction of teeth, and equally as much from our present conception as to the nature of the operation. Their writings plainly show that they were little, if at all, familiar with this operation. Galen, a prolific and conscientious writer, fond of long descriptions, devotes scarcely more than a few words to extraction, and does not give either its indications or its *modus operandi*.

Dentistry, even in the most remote epochs, was absolutely independent of medicine and general surgery. Dental prosthesis, a very ancient art, as we have seen, was practiced by persons having no connection whatever with medicine, but who were artisans and mechanics. These ancient prosthetists, it is but natural to suppose, must have had to perform extractions of diseased, painful, and loose teeth, and of those partially destroyed by caries and thereby rendered not only useless, but acting as obstacles to the adaptation of plates. We are even familiar with the name of one of these ancient dentists mentioned by Martial in one of his epigrams. Of this specialist he says, "Cascellius pulls and treats diseased teeth."

From the historical considerations referred to in this paper we may draw the following general conclusion: That dentistry, notwithstanding its intimate relations with medicine and general surgery, has always been practiced mainly independently of the medical profession proper. This separation between medicine and dentistry is caused essentially by the part which prosthesis is called upon to play in the dentist's sphere of activity.

CERTAIN OBSERVED PHENOMENA OF PRESSURE ANESTHESIA.

By FRANK W. SAGE, D.D.S., Cincinnati, Ohio.

(Read before the Cincinnati Odontological Society, November 1903.)

IN the many articles that have been published on the subject of pressure anesthesia I have failed to note any express mention of certain phenomena that are not unworthy of attention and study by anyone experimenting in this the latest method of painless pulp-extirpation.

First of all, it seems not to have been particularly emphasized that in conditions of pulp-congestion, especially if stasis have supervened, satisfactory results need not be expected. Again, somewhat free exposure and a previous excision of the suppurating surface of the pulp, if the attempt be nevertheless made after congestion has set in, would seem to be absolutely necessary. Having proceeded thus far, the effect of cocain applied under pressure is in most instances remarkable. In a few seconds, oftentimes, the pulp becomes so thoroughly anesthetized that it may be removed without discomfort.

I have tried, empirically, a pellet of cotton saturated with purified chloroform, with which to take up a small portion of powdered cocain (hydrochlorid or muriate), applying to the exposed pulp *pro re nata*. Or as a preliminary to cutting down to and exposing the pulp, I use the same agents in this combination—as in cases where it is desired to destroy a healthy pulp in pyorrhea treatment, or for crowning, or for other purposes.

The first shock of pain when a *healthy* pulp has been deliberately cut into may be instantly controlled by the pressure method. Once a healthy pulp has bled slightly, conditions favor the instant absorption of the agent. I may say in passing, that I have had no more diffi-

culty in the multi-rooted teeth than in those of one root. All seems to depend solely on the question whether or not circulation throughout the pulp continues.

I employ pressure anesthesia as a preliminary, even in cases where I propose to use an arsenical preparation to destroy the pulp, for the purpose of exposing and excising the already suppurating surface of the pulp. For a condition of suppuration exists earlier, oftentimes, than is commonly supposed, and may be premised as a condition in all pulps that have ached once or twice. I am not afraid to use arsenic, and prefer to employ it in most cases, after this preliminary treatment and exposure, instead of attempting the entire removal of the pulp under pressure. This is for reasons which I shall now set forth, and which furnish the theme of this paper.

The objections to employing pressure throughout the operation—that is, to say, to the finality of removing the entire pulp—are several. First of all, it is practically impossible, in many cases, to entangle and remove at once the finer filaments of small roots. Even in large roots it will often be discovered, on exploring the canal after the effect of the anesthetic has passed, that it is exquisitely sensitive. This indicates that part of the closely-clinging membrane lining the canal—membrane penetrated by nerve-filaments—has not been removed. The tissue is tough, clinging, resistant, as is healthy periosteum. When we remove an already dead pulp, whether deliberately devitalized or dead as a result of inflammation, we have a different condition to deal with; a line of demarkation has already been established through

sloughing, and there is less of this clinging resistance.

As a corollary of the preceding, it frequently appears that in an attempt to remove a perfectly healthy pulp, after anesthetizing in this way, and by the ordinary medium of entangling on a broach or nerve bristle, there may be observed a certain resilience of the tissue, so that it stretches like a rubber cord, springing back after breaking off. Here it is that trouble may supervene. I have noted in various instances more or less inflammation in the apical region following this stretching. In the case of one patient, a Yale college student who came at the last hour to me, as his vacation drew to a close, a wholly unexpected complication set in after the removal of pulps under pressure in two bicuspid. The pulps were easily removed, leaving in this instance no occasion for returning sensitiveness. Yet both teeth troubled the patient during that night, and despite the appearance of a favorable condition within the roots—no sensitiveness whatever appearing—I hesitated to fill, large contours being required, and in the end dismissed him to the care of a New York friend and fellow practitioner.

It would seem necessary, in order to avoid this stretching of the pulp, to

effectually sever the pulp at the apex after introducing the broach, by repeated twistings, before withdrawing it. Even then there is no guarantee that the pulp tissue may not have been drawn through the foramen.

I have furthermore had complaints of sensitiveness and soreness, long continuing, in multi-rooted teeth treated by this method and at once filled. This would seem to indicate that all sensitive tissue had not been removed, notwithstanding that no sensitiveness appeared at the time.

[In the discussion which followed attention was called to the advantage of combining with the cocain solution the adrenalin chlorid as a styptic. Dr. J. S. Cassidy, in answer to the question whether any advantage was to be expected from the use of chloroform as described, said that the salts of cocain are soluble in this agent, but not the pure cocain itself. He further suggested that in the instance of the student cited, if the canals had been filled overnight with iodoform in some essential oil, as of cloves, the fillings might probably have been inserted the day following, with no worse result to be anticipated than a slight soreness.]

THE GATES-GLIDDEN DRILL: A FEW SUGGESTIONS.

By **Mr. S. J. FERNANDEZ, Sydney, N. S. W., Australia.**

IN submitting these remarks I do so without designing to criticize the methods adopted by others, but in order to give a few hints as to my own methods for the benefit of students and others, that they may obtain the best results from these often misunderstood and neglected little instruments. There are perhaps no other instruments in the operating room to which is attached so much importance as these drills; for they

are such a great factor in that scientific practice of today, dead-tooth-salvation. Because of their great value and delicacy they need especial care, both in and out of use.

Before dealing with their uses and how to employ them to the best advantage, the question of the different varieties to be selected demands our attention. The drills that should be chosen are those made with the shanks tapering from the

head to the shoulder, so that if a break occurs it is likely to be at the weakest spot, namely, the shoulder. This arrangement leaves the shank accessible, so that it may be grasped with pliers and taken out. The point on the drill-head should not cut, but merely act as a guide to enable the drill to follow a canal no wider than itself, until it reaches the root-apex, through which only the sharp point will pass—not with a sudden movement that would endanger the drill-head, but with a gentle action that will produce a sensation of pain which will give notice of its protrusion. If the foramen be not wider than the base of the drill-head it will not cut through the end of the canal—a danger which is avoided by this form of point.

The correct way to use the drills is to employ the series, from the smallest to the largest; of course, some cases may contradict this method in large canals, but in the majority of cases adherence to this rule will save much time and inconvenience.

THE GATES-GLIDDEN DRILL IN USE.

Where the dentin is hard and resistant to the drill it is well to commence with a fissure bur, after which the drill will cut effectually. Where the canals are distorted a small rose bur will be found useful in removing small obstacles in the base of the canal.

The great danger in using these drills is, as before stated, their liability, especially in unskilful hands, to snap off and impede further ingress to the canals. In skilful hands this danger, although not altogether eradicated, is reduced to a minimum, as the operators by their experience attain what is known as the "touch" of the drill. It is sometimes inevitable that the operator has to drill around a curve, and when this is necessary he should exercise great precaution. For instance, if a resistant spring is felt, and the drill does not indicate by touch that it has reached the apical foramen, we know that there is a bend in the canal, for the curve pressing upon the drill

gives this backward spring; neglect this signal, apply more pressure, and the drill-head will snap off, and your results most likely terminate in failure; for a drill-head broken off above a curve is a difficult thing to remove. The method of procedure in the case of a curved canal is as follows:

If a small drill has been used, employ one with a larger head and stouter shaft, as it may often have the power to withstand the strain while the drill-head cuts. If it were the largest size that was being used, it should be replaced by a small fissure bur. By using the small fissure bur the bulge in the wall of the canal where the curve lies—if not too pronounced—will be cut away, giving the drill great assistance, since it has given it the direction and enlarged the canal at that point. Should these methods be unavailable (in very constricted canals), then other treatments, such as "mummification" of the pulp, and the sulfuric acid process,* should be resorted to.

In dealing with distorted canals there is still another danger, that of drilling a false opening in the side of the canal before the apex is reached. In abscessed roots this is a common cause of failure, as through inaccessibility to the apical foramen through the canal the removal of the cause is rendered, if not altogether impossible, very difficult. In any case, if the root be not abscessed, such an occurrence would be certain to cause periodontitis, and probably later on alveolar abscess.

Another danger is that of clogging up the drill-head by pushing débris before it. This is the result of working too rapidly. To avert this risk the drill should be frequently withdrawn, and the constant use of the chip-blower is advised, to clear away the débris. In cases of curved roots, such as these, careful inspection of the canals should be insisted upon, and the insertion of broaches and fine platinum points will

* I described this method in the October 1903 issue of the DENTAL COSMOS, in an article entitled "A *Résumé* on Roots and Their Treatment."

give the operator some idea of the shape he will have to contend with.

Lastly I will touch upon a very hazardous operation, that of the

REMOVAL OF BROKEN DRILLS IN CANALS.

In anterior teeth and others easy of access, enlarge the canal and if possible try to loosen the broken drill, and with the water-syringe inject a stream of water into the canal suddenly, and with as much force as possible. If this plan fail, employ the following method: Enlarge the canal as in the first place, and try to loosen the broken drill as before. Now take a small piece of German silver (No. 32 standard gage), bending it in tube form to the size of the broken shank. Now solder one end of the tube to the shank of the drill, as neatly as possible, so as to allow no overhang of solder which would impede its progress in the canal. A tube has now been formed that will, if accurately made, fit over the broken piece. I might mention that the addition of a little shellac varnish, placed in the mouth of the tube, will facilitate the operation considerably. In difficult cases in anterior teeth, such as curved roots, try the treatment prescribed under the next heading.

POSTERIOR TEETH.

In these cases, which are usually difficult of access, we must depend on chemical action to a certain degree, before attempting to remove the broken drill by mechanical efforts. Here I would advise the following method: Saturate a pledget of non-absorbent cotton wool with a twenty-five per cent. solution of pyrozone, and introduce it into the canal, sealing the same with gutta-percha or sandarac varnish, and leave it in the tooth for at least three to four days. When the patient returns, remove the application, and the drill will be found to be completely rusted and loosened, so that a forcible injection of water from the bulb syringe will readily effect its dislodgment.

CARE OF THE GATES-GLIDDEN DRILL WHEN OUT OF USE.

Not less important than the care of the drills while in use is the care of them out of use. When they are frequently in use, their sharpening is an item that should never be neglected, as a blunt drill, besides being ineffectual, is a source of annoyance to both operator and patient; it is the cause of many mishaps excused on the plea of "faulty drills." The method of sharpening them which I will describe, although familiar to many, may still be new to some.

With the use of a piece of oilstone shaped like a pocket-knife blade (say three inches in length and with a sharp edge) it is a comparatively easy matter to bring in turn each blade of the drill to an edge—examining the drill frequently during the process under a magnifying glass.

It is essential to good work that the stone edge be kept sharp. To accomplish this obtain a piece of hard wood say three inches long, and two inches in width, making sure that it is straight and perfectly level. Now take a strip of sheet lead two inches wider than the wood, but the same length, or longer, so that it may be continued over each end; tack it over the sides and ends (if necessary) to the wood, after having adjusted it evenly. Upon the surface thus formed sprinkle some No. 1 emery, and rub the stone lengthwise without oiling or wetting the surface. To keep the stone in perfect condition this process should be continued after every dozen drills. As to the time required for sharpening the stone, three minutes usually suffices.

When utterly worn out, the drills can still be made to render useful service by grinding them to a spear point upon the lathe stone. In this shape they are very useful in alveolar abscess, where it is to be approached from the outside, through the alveolar process.

If the top of the shanks be ground flat and the surface serrated, they make excellent canal pluggers. In cleaning the drills after use they should never be placed on a wire wheel, such as are used

for cleaning ordinary burs. The correct way is to polish with cotton-waste wheels, using pulverized pumice or emery powder; and always keep the drill blades in the direction in which the wheel is turning.

Their liability to rust, even after being thoroughly cleaned, warns us that they need to be carefully packed away when out of use; this seemingly trivial matter is of the utmost importance.

I prefer to keep them in a glass cylinder, such as are used for containing cer-

tain forms of gold. A pledget of absorbent cotton wool is to be saturated with lysol and the oil used in the Edison battery in equal parts, and placed at the bottom of the cylinder. Into the mass thus formed the heads of the drills should be buried, the whole being sealed up with the cork of the bottle. When acids have been employed in the treatment of the canals—especially sulfuric acid—a pinch of sodium bicarbonate sprinkled in the mass will be of assistance, owing to its neutralizing effects.

CORRESPONDENCE.

THE LATE DR. J. FOSTER FLAGG'S ANCESTRY.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I trust Dr. Trueman will not take offense if I make one small correction in his otherwise admirable article on Dr. J. Foster Flagg.

The ancestor of Dr. Flagg, and of nearly all the Flaggs in this country, was, as he says, Thomas Flagg, who settled in Watertown, Mass., in 1642. But he was not "supposed to be an Irishman." According to the original English shipping lists he came from Shipdam, Norfolk, Eng., in the "John and Dorothy," with Sir Richard Carver. Shipdam is a small town in East Flegge "hundred." The Flegge family (Thomas spelled his name with an "e") came into Norfolk with the Danes in Alfred the Great's reign, and two "hundreds" were named for them because of their importance—and are still so named. The name comes from the same stem as the German

"fliegen" and English "fly," and Norfolk tradition has it that the name was given to a viking of the family—or "flier" on the water.

President Garfield was a Flagg on his mother's side, being descended from Gershom, eldest son of Thomas, and he bore the old Flegge type of head found on brasses of the fourteenth century. My father, Dr. A. S. Flagg, was often mistaken for Garfield, though their blood connection was no nearer than the earlier part of the seventeenth century.

Dr. J. Foster Flagg strongly resembled other descendants of Thomas Flagg, notably some in the line of Thomas's sixth son—showing how persistent is this form of heredity.

Respectfully,

JOHN S. FLAGG, M.D.

BoSTON, January 19, 1904.

THE RECIPROCITY CLAUSE IN THE DISTRICT OF COLUMBIA DENTAL LAW.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I have the honor to request space in your journal in which to answer your editorial in the March issue of the DENTAL COSMOS. Having drawn the provisions of the law myself and had it passed with the assistance of my friends who are likewise interested in "reciprocity of dental licenses," I think I am perhaps more familiar with its intent and scope than anyone else, and I desire to correct some points made in your editorial that I think upon further deliberation you will concede to be in error.

In the first place, as you say, the law is local in its scope; but it is also national, from the fact that it allows any dentist of any state or territory, who can comply with its provisions, to practice in the District of Columbia. The conditions are—First: That he shall have been in legal practice in some state or territory for a period of five years or more. Second: That he shall have in his possession and shall present to our board a certificate from the state or territorial board in which he practiced, "certifying his competency and moral character." Third: That he shall prove to our board that he came by the certificate honestly—in other words, that he is the rightful owner thereof—and that he has "been in legal practice for a period of five years or more."

There is no dental law now on the statutes of any state or territory that has anything to do with this certificate. It is purely a voluntary act by the state board in which the applicant has been in practice; thus it is entirely discretionary with this board whether it shall give the certificate or not, no matter if this board has in the past examined the party under the highest

or lowest standard law in the country, and has given him a certificate or license to practice in that state. It is upon this discretionary power that we depend for protection from the quack and the incompetent; and, to avoid any mistakes being made in the matter through a misunderstanding of our law and the conditions, we retain the further discretionary power of investigating the matter before passing upon the same and issuing a license to practice.

We take it for granted that no state board will voluntarily issue this certificate to any other than competent and moral practitioners—and let the word "moral" cover considerable ground if you please—they being personally aware of the fact, or it be proved to their satisfaction. Our board will not accept merely the certificate of another state board which was issued to the applicant to practice and under which he has practiced for five years or more, but will require a special certificate signed by all the members of the board of the foreign state as before mentioned. At least this is my impression, and it was well considered when I drew up the bill. I not only had in mind the feature of reciprocity of license, but an absolute protection from quacks and incompetents—which is a feature no high or low standard dental law has ever had any effect upon. In fact, instead of acting as a restriction, the dental laws so far promulgated seem to breed them, and as these persons are the class the dental laws are supposed to be enacted to protect the public from, certainly such a law as will protect the public should be encouraged and adopted wherever possible; and this "reciprocity clause" of our law can be adopted word for word and not interfere with the standards of any dental

law in the country, or with other provisions.

You say, "As far as it goes we regard the amendment as a wise and useful measure, and it is perhaps doubtful if in the present state of professional and public opinion a broader measure could have been enacted." Our "measure" takes on reciprocal relations with every state or territory in the Union upon the simple conditions of "competency and moral character" without regard to high or low, medium or no standard, graduate or non-graduate; so in what manner we could have made it "broader" I would be pleased to be enlightened.

Again you say, "Our criticism upon it would be that as an effective instrument to secure practical reciprocity it should have provided that any applicant for license to practice dentistry in the District of Columbia who has already received a license from the board of dental examiners of any state or territory which maintains a standard of qualification fully equal to that required for license to practice in the District of Columbia should be entitled, upon certified proof of the facts in the premises; to a license without further examination."

The editor, judging from these remarks, seems to have overlooked the base from which this law of ours emanated, viz, the "specific conditions of interchange of license" laid down by the resolution of Dr. Stockton, adopted by the National Association of Dental Examiners at Asheville last summer. These specific conditions were: "*Any dentist who has been in legal practice for five years or more, and is a reputable dentist of good moral character, and who is desirous of making a change of residence into another state, may apply to the examining board of the state in which he resides for a new certificate which shall attest to his moral character and professional attainments, and said certificate, if granted, shall be deposited with the examining board of the state in which he proposes to reside, and said board in exchange therefor may grant him a license to practice dentistry.*" As the above resolution was adopted by the repre-

sentative national body of the state examining boards and specific conditions were attached thereto, and as these various boards are the parties with whom we must deal for a faithful attempt to carry out the provisions of these conditions, it is reasonable to suppose that any law passed must conform to these specific conditions in order to meet with their approval. This resolution also deals with "discretionary powers," and it distinctly gives the boards of both states interested in an exchange the discretionary power to give and to grant the "new certificate" and the "license" to practice.

Our law conforms to this to the word, except in the one instance of the word "territory," and that is excusable from the fact that the national Congress legislates for territories as well as states. I would have been willing to have trusted the state boards, but they do not seem willing to trust each other, and there was no alternative left me. This also answers the point you make against "discretionary powers of state boards."

Now, last but not least, I will come to the question of standards. Again I refer you to the "specific conditions" of the Asheville resolution. This does not consider standards in any manner, and besides, we are supposed to be legislating for those most entitled to interchange of license, viz, those in practice for a number of years, or a period long enough to make it a hardship to pass an examination. This feature is made for the purpose of giving relief to the 35,000 dentists in practice, and refers to the past and not to the future standards. You cannot raise the standard of the man already in practice by any law that can be written, let alone passed, and as state dental laws are various, with standards ditto, and we have been talking "uniform standards for all states" for the past twenty years and are no nearer than when we started to talk, our experience should not allow standards to interfere with reciprocity of license, or we shall find our reciprocity laws as various as are the state dental laws, and equally as far away from practical results. The very fact that you proceed to lay

down a reciprocity law to conform to your ideas on the subject, in your editorial, is a perfect illustration of what will happen if the law-makers of each state set their heads together to get a reciprocity law in their state to conform to the individual ideas of what such a law should contain in its provisions, and its warning should be heeded. The effect of such legislation is just what the whole profession is seeking for a way to avoid. Had the District of Columbia adopted such a reciprocity law as you propose, there is no state in the Union we could exchange with until their standards were raised as high as ours can be.

Section 3 of our law deals with the question of examinations as follows: "That it shall be the duty of the board of dental examiners . . . Third, to test the fitness and pass upon the qualification of persons desiring to commence the practice of dentistry in said District after the passage of this act, and certify to the health officer for registration such as prove, under examination in the theory and practice of dentistry, qualified in the judgment of the board to practice dentistry in said District." You will observe by this that the matter of "standard" is only limited by the ability and brains of the members of the board, and the heavens above. This is a "discretionary power" I am not responsible for, and its equal is not upon the statutes of any state or territory of the Union.

"An effective instrument to secure

practical reciprocity" was provided by Dr. C. S. Stockton, in the provisions of his Asheville resolution, at your personal request to the Jersey Society last summer at Asbury Park, N. J., "that the Jersey Society initiate a movement for reciprocity of license." Dr. Stockton accepted your advice upon the subject and proceeded to "initiate a movement" with the result that it was accepted by the National Association of Dental Examiners and adopted by them, specific conditions and all. Taking this practical result as being the sense of that body, and their record of the fact as final upon the subject, and not desiring to make the mistake plainly shown in our various state laws, I accepted the "specific conditions" and phraseology, without additions or subtractions; and if "reciprocity of license" is ever to become a success, my advice is, "Go thou and do likewise." In ending, I will quote you again: "Make it possible for a qualified practitioner of any state to practice dentistry wherever circumstances might place him throughout the Union."

As it takes about five years to make a "qualified practitioner" out of the dental student taken from the college door, I think our law covers all the requirements of a uniform law throughout the Union, and as such I commend it to my professional brothers and fellow law-makers.

Respectfully yours,

EMORY A. BRYANT.

WASHINGTON, D. C., March 6, 1904.

PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Anniversary Meeting, January 1904.

THE thirty-seventh anniversary meeting of the New York Odontological Society was held on Tuesday evening, January 19, 1904, in the large hall of the Academy of Medicine, No. 17 West Forty-third street, New York city.

The president, Dr. John I. Hart, occupied the chair and called the meeting to order. President Hart welcomed the guests of the society, and extended to them the privileges of the floor.

THE PRESIDENT. Before entering on the regular order of business, Dr. Bogue has a request to make.

DR. BOGUE. It is simply this: that as many gentlemen as can find it in their hearts to do so will take impressions and make models of all the children's mouths between six and ten years of age that they can find, and let me have them. The reason for this request is, that unless a sufficient number of children's teeth can be examined, certain inferences, that are pretty near the surface now, cannot be reached; but with such a number as will allow one to draw proper inferences I think something can be learned that will be of interest and value to every one of us. I will make the request, at any rate, in the interests of the profession—for everything that is discovered under those circumstances is freely given out.

THE PRESIDENT. Ladies and Gentlemen: The essayist of the evening, a gentleman of national reputation, needs no introduction to this body at my hands; but I wish to take this opportunity of expressing my admiration of his many-sided qualities, and to state that, as a body, we admire him as a teacher, we

respect him as a writer, and we revere him as a dentist. I take great pleasure in presenting Professor C. N. Johnson of Chicago, who will read a paper on the subject of "Principles Underlying the Insertion of Approximo-Occlusal Gold Fillings in Bicuspid and Molars." (Published in full in the March issue of the DENTAL COSMOS, at page 180.)

Discussion.

DR. E. T. DARBY, Philadelphia. When your worthy secretary invited me to be present tonight to open this discussion, I had not yet seen a copy of the paper which we have just heard; but I imagined that the discussion, so far as I personally am concerned, would be more in the nature of an indorsement than a difference of opinion. Knowing Dr. Johnson's method as I have for some time, and having read most carefully the book which he published a year or two ago, I was pretty well assured what position he would take in reference to the treatment of the approximo-occlusal surfaces of bicuspid and molars. It may be remembered by some of you that at a meeting of the Second District Society, held in Brooklyn about two years ago, the subject of "extension for prevention" was under consideration. At that time, I could not indorse what Dr. Johnson had written, as to extensive cutting in the anterior teeth, and perhaps I differ with him somewhat today on that score; I am sure I differ with those who take extreme ground in cutting the anterior teeth. But when it comes to the treatment of approximo-occlusal cavities in the bicuspid or molars I differ very

little from Dr. Johnson in the principles he has laid down tonight.

Dr. Bonwill used to say that he had never cut teeth too much, but ordinarily he had cut them too little; and as time goes on I am pretty well convinced that in the past all of us have cut too little, and that we have not extended our cavities sufficiently, buccally and lingually.

I may differ with Dr. Johnson a little about the shape he gives to the gingivobuccal and gingivo-lingual border of the cavity. Whether it should be slightly rounded, or at right angles, is a matter of opinion; but he is unquestionably entirely right about the shaping of the cavity in the substance of the dentin. The habit which some have of drilling deep retaining pits is unnecessary. If the cavity be at right angles at this point it is retentive in shape. If any of you have tried to dislodge from such a cavity a filling which has been well packed, you have found it difficult to do. We have in the past made too much undercut, and unnecessarily sacrificed sound dentin, fearing that our fillings would not be retained.

I heartily indorse what Dr. Johnson has said about the use of non-cohesive gold in cavities of this kind; it has been my practice for more than thirty years. I never come before my class and advocate anything but soft gold for the upper third or half of such fillings that I do not feel I am teaching what I ought not to teach. In presenting this subject to my class the other day, I halted and said: "Gentlemen, I feel like a hypocrite. I am teaching you to use cohesive gold in this class of cavities because you are students, and it is easier for you to use cohesive gold at first, but when you have become skilled in the use of non-cohesive gold you will use it in the upper portion of all approximo-occlusal cavities.

You may ask why I teach the students one thing and practice another. Students are liable to be confused. If I say all fillings are to be started with non-cohesive gold they will make failures, because it requires more skill than to start with a retaining-pit and pack cohesive gold piece by piece.

The gold you buy for soft gold is not always non-cohesive. It may have lost some of its cohesive properties by age. The S. S. White Co. is making a preparation of gold known as Pack's *soft* cylinders. They possess that exceeding softness that the Abbey's soft foil does, and they are admirably suited to the work Dr. Johnson has spoken of tonight. These cylinders of quite large sizes may be used without danger of clogging or bridging. We sometimes lose sight of the fact that it is adaptation, not hardness, that saves teeth. We want a perfect fit—a moisture-tight joint, and that can be attained with infinitely less labor and with greater certainty by using a non-cohesive gold.

And then, what a saving of time! Dr. Johnson has already alluded to the laborious effort on the part of the operator to restore such surfaces with cohesive gold and has made mention of the terrible strain on the patient. At least one-half the time might be saved, and much of the wear and tear on the patient eliminated, if we would use soft gold in the upper third or half of the cavity; and when that gold is driven home with the decided blow of the hand mallet, or the impact of a heavy blow from the automatic mallet, it will withstand any ordinary force that may be put upon it.

There are conditions in which I think it desirable to extra-contour our fillings in the bicuspid and molars. It was the practice of Dr. Bonwill to a considerable extent. His method was to open the cavities in the bicuspid and molars from the occlusal surface, remove the caries, and give the cavity a general shape; then he would fill the cavities and the interproximal space with pink gutta-percha and send his patient away for three or six months. At the expiration of that time it was found that by mastication upon the tough gutta-percha the teeth had been somewhat separated, the gum somewhat pressed away from the gingival border of the cavity, and the permanent filling could be inserted under most favorable conditions. By giving the approximal surfaces an excess of contour he carried the margins of his filling

farther away from the point of original contact, and there was less liability of too much space between the teeth when they had assumed their original position.

I have adopted this method in many instances, especially in the spring and early summer, when the demand for time is greater than my ability to supply it for permanent work, and I have found that when my patients return in the autumn for permanent filling, a nice space has been obtained, the gum is somewhat above the gingival border, and the work is made much easier for the operator and less painful for the patient.

We cannot be too careful in observing what Dr. Johnson has said about destroying our contour by running disks and strips between the teeth in the act of finishing the fillings. I have frequently observed this on the part of students. After spending a great deal of time in the effort to obtain a nice contour with the gold, they have ruined all that they had hoped to accomplish by running sandpaper disks between the teeth, thus removing too much gold and leaving a space liable to become impacted with fibrous food.

The suggestion of Dr. Johnson to shorten a cusp here and there when it is long and when it tends to force the teeth apart, is an excellent one. I have been in the habit of truncating the cusps of molars wherever I have found a tendency to the impaction of fibrous food between the teeth, whether in sound teeth or those which have been filled, thus relieving the patient of a great discomfort.

Dr. A. R. STARR. I feel very much the same as does Dr. Darby in regard to the discussion of this paper, and believe that the most that could be said about it would be in the way of commendation. I have read the excellent work of Professor Johnson, and have gained considerable useful knowledge from it. It may be on that account that my methods are very similar to those of Dr. Johnson, although I differ from him somewhat in the method of preparing approximal cavities—a very slight difference, but perhaps worthy of notice. Dr. Johnson has said that in the preparation of these cavi-

ties he makes the cervical or gingival wall as nearly straight or horizontal as possible, presenting a flat surface and forming as nearly as practicable a right angle with the axial wall. In regard to the side walls of the cavities (the buccal and lingual), he tries to get them as nearly parallel as possible and at right angles with the axial wall, making but a slight dip in the dentin at the linguo-gingival and the bucco-gingival angles. I do not doubt that this makes a very good anchorage, but I modify that plan somewhat, especially for this method of combining non-cohesive and cohesive gold, because I believe we can get better anchorage, with less difficulty in combining the two kinds of gold, by such modification, which I will now describe: I believe in extending this little dip into the dentin at those angles, continuing the groove slightly toward the occlusal and also toward the central portion of the gingival wall, because in that way I think we can get better retention, and greater convenience, not only in starting the filling, but also in combining the two kinds of gold.

I recognize the advantage of filling the cervical portion of such cavities with non-cohesive gold, but I also use another method which I will describe later, and which I consider to be equally as good for most cases.

At the New York College of Dentistry it is customary to give our students small plaster models, such as I have here, and to instruct the student in regard to cavity preparation by having him cut various cavities in such models. I will pass some of these models around that you may see how the cavities have been prepared, and you will notice that they do not differ very materially from the method which Professor Johnson advocates. I have said that I extend these little depressions at the gingival angles, slightly toward the occlusal on the buccal and lingual walls and toward the median line on the gingival wall.

Professor Johnson's method is to make a slight depression at the gingival angles, making a sort of right-angled dip into the dentin at either side. What

is the advantage of extending those depressions in the dentin toward the occlusal or toward the central portion of that cervical or gingival wall? At the beginning of my career, like most young practitioners, I undercut my cavities too much, and perhaps I have not yet overcome that fault, but it seems to me that the reasons for this extension are plausible.

After having introduced the non-cohesive gold into the deeper portion of the

involving the occlusal and approximal surfaces of the teeth. Prepared as advocated by Professor Johnson that would be the outline of such a cavity. In condensing the non-cohesive gold in the cervical part of the cavity, if it be a distal cavity in a molar, there is hardly any instrument we could use, be it bayonet-shaped or otherwise, which would give us the proper condensing force against the axial and gingival walls. You cannot apply the force as well as in

FIG. 1.

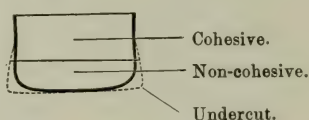
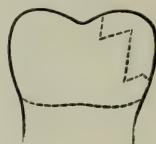


FIG. 2.



FIG. 3.



cavity, we still have with this plan a slight depression at either side of the cavity, in which we can start the cohesive gold, and thus do not depend entirely upon interdigitation or the forcing of the cohesive into the non-cohesive gold as a means of uniting the two and securing anchorage. I know cohesive gold can be so forced into the non-cohesive as to get the two pretty firmly united, but the cohesive gold is not so firmly anchored as if we have a slight depression here at each side in which to start it. I believe, therefore, in extending those grooves for a slight distance to reach that part of the cavity in which we wish to begin the introduction of the cohesive gold. (See Fig. 1.) I believe in a slight groove or bevel along the gingival margin, especially in cavities involving the distal surface of the teeth, because we can better condense the gold in a cavity thus prepared and get better retention.

Let this (Fig. 2) represent a cavity

a mesial cavity. Therefore we consider it advisable to make a slight bevel or groove in the gingival wall for the lingual and buccal thirds, or a slight bevel all along that wall; because that would give us a better surface against which to condense the gold than if the wall were horizontal. In a large cavity involving a considerable portion of the approximal surface and also the occlusal, I believe in modifying the step portion in order to get better retention, by making an inclined plane here as well. (See Fig. 3.) We get better anchorage in this way than if we have simply a flat surface or surfaces arranged horizontally.

These are not new methods; I simply mention them in comparison with the methods spoken of in the paper. Sometimes I follow another plan in filling these cavities, perhaps because I am a little bit lazy and find I can get along easier than with the combination of cohesive and non-cohesive gold. I frequently

use the crystal mat gold in starting such fillings, filling the cervical portion of the cavity with the crystal mat gold and finishing with ordinary cohesive foil in cylinder or other form. The advantage, I think, is that the crystal mat is less difficult to manipulate than the non-cohesive gold. It is quite soft and plastic, and although it crumbles somewhat it works more like putty than any other kind of gold I am familiar with. It goes nicely into the undercuts and into any inequality or depression and condenses without much pressure. You can use it in large pieces, where it is not exposed to stress. These crystal mat golds are extremely cohesive. The Solila gold is very cohesive, and there is no difficulty in uniting the cohesive foil with it, thus making a more homogeneous filling than the combination of non-cohesive with cohesive gold. The crystal mat gold may perhaps require a little more care in the finishing of the margins, but by allowing a portion to project and subsequently condensing it well against the margins this difficulty can be overcome.

I seldom use a matrix. I prefer to see the margins as I go along, and I prefer to mallet the gold directly against the margins rather than against the matrix.

After having filled one-third or one-half of the approximal cavity, I believe in then polishing and finishing off the cervical portion of the filling before making the contour; in that way there is no danger of disturbing the contour, and it is much easier to get perfect access to the cervical margin than if we wait until the filling is complete in regard to contour. These little extensions of undercutting previously mentioned will assist you in this mode of finishing a filling, for if you have extended the undercuts in the manner indicated there will be less danger of dislodging the gold in the trimming and polishing. In regard to the method of having the cervical wall of the cavity flat or horizontal in preference to being convex with the convexity directed toward the root, I agree with Dr. Johnson. I think that is the proper method, and wherever a cavity comes near to the neck

of the tooth (to the union of cementum and enamel), I believe in extending the cavity to that line and into the cementum rather than have a frail wall of enamel at that point.

I also follow the method referred to by the essayist in regard to cutting off the cusps of opposing teeth, to prevent fracture and to give a stronger occlusal surface. I think I first gained information on that point from reading "Methods of Filling Teeth," by Dr. Ottolengui.

With regard to cutting off cusps of opposing teeth to prevent the forcing of food into the interproximal spaces, that is a new idea to me. I have not observed that condition to be the cause of such troubles. If it be so, and it can be remedied as simply as suggested by Dr. Johnson, I am very much indebted to him for the suggestion—more so than I can possibly repay.

I have listened with much pleasure to the paper, and there are in it many points of interest which it will be desirable for all of us to digest.

Dr. S. G. PERRY. We have been a profession for about sixty-five years—I think the first college was established in 1839—and it has taken all that time to arrive at this simplicity and scientific directness of statement. We have fumbled in the dark until we see at last—as with all great things—great simplicity. These methods are the simplest I have known in all the years I have been in practice. I commend the paper from beginning to end, with perhaps a slight difference in the preparation of cavities which I will not go into now. The making of strict contours, as you know, has been a very tender question with me for over a quarter of a century, and it is with great delight that I hear the statement made tonight that there should be strict regard to the shapes of the teeth.

The use of soft gold for the upper third I have practiced as long as I can remember. I hardly remember the time when I have filled a cavity throughout with cohesive gold, although in the early years, when I was under Dr. Varney's influence, and later, being influenced by Dr. Webb somewhat, I did fill them en-

tirely with cohesive gold and with mallet force. Those fillings are standing as well as the others, but they were done very laboriously and with great tax upon the patients. The fillings that I have been doing in the past twenty-five years by the combination method have been done very much more rapidly, with greater ease for the patient and with as much success, as far as I can observe my work—and I think everyone is his own best critic. We do not always admit that we know, but as we grow older we do know whether we are deteriorating or whether we are keeping up to the mark; and I think my later fillings with the combination method are as saving as any fillings I ever made.

I have been in the habit of making, all my life, more shallow grooves than most men in the profession, as far as I can judge; my grooves have sometimes been made so shallow that they have not held the fillings, and I have made them so for two reasons: First, an inherent cowardice, which is personal to myself; a great dislike of causing pain and cutting any more than can be helped—my utter dislike of making anything disagreeable for anybody; and the other reason, that deep grooves are hard to fill properly. A shallow groove can be filled readily. Then, with shallow grooves, the use of the soft gold for one-third, one-half, or sometimes two-thirds of the cavity has insured the tight fit of the upper part, and that is what saves the teeth. I have not had much anxiety about the cervical border, as the plugger point is applied directly to that border. When it comes to filling along the borders on the buccal and lingual, as you progress toward the grinding surfaces, it is a horse of another color. Your instrument is packing diagonally, and there you are liable to imperfect condensation. I rarely, if ever, make any grooves across that cervical border. If I use a matrix or a system of matrices, I pack the gold for the most part by laying the cylinders in, and using little folds or rolls of cotton or bibulous paper for forcing down the first few cylinders, in the same manner as we use pieces of bibulous paper or

spunk in making matrices for inlays. Dr. Darby did the same thing a quarter of a century ago in packing amalgam, and why should it not be done in the same way with large pieces of gold? I find no difficulty in fixing the gold along those borders by pieces of bibulous paper, with the greatest rapidity, and insuring a very accurate fit, and by the use of instruments designed to fit closely along the matrix you get a perfect adaptation, so that when the matrix is removed, and the fine finishing disk is passed over, I would defy anyone to make a closer fit.

Years ago I used to overlap the cavity, but I do not do that any more. I am not afraid to let the matrix fit closely, but I go over it very carefully. I have instruments to reach every margin. How can anybody get a better fit than in that way?

The matter of the restoration of contour is of the greatest importance. I saw recently two beautiful approximal fillings in adjoining surfaces on bicuspid, done a year ago, well under way of decay under the margin, caused by nothing at all except that the fillings were not quite plump. Stringy pieces of food wedged between them and had never been faithfully removed by the patient. If they had been bulged out and not trimmed away, or if the separator had been put on before the filling was completed, before the last gold was being packed, and a firm point of contact made, they would have been beautiful and lasting examples of work.

I have not words to express my admiration for the style of this paper. Dr. Johnson is a literary as well as a dental artist. It is a clear and sensible and sane statement from beginning to end; and if you gentlemen will take the trouble to read it over when it is published, you will find it is the most scientific and simple statement, after sixty-five years of hard effort on the part of the dental profession.

Dr. M. L. RHEIN. I had the pleasure of seeing Dr. Johnson's paper before coming here this evening, and I heartily coincide with all the pleasant things that have been said about it. I believe that

at heart there is very little difference between us on this subject, except in some of the details. There is, however, a decided difference in regard to some of those details, and I differ decidedly with the remarks made by Dr. Perry. I do not believe we are agreed at all at the present day upon how the gold should be inserted in an ocluso-approximal cavity in the posterior teeth. There is a wide divergence of opinion on this subject between the question of a filling such as has been presented by Dr. Johnson and one made entirely of cohesive gold.

My purpose is not to try to change the methods of practice of any of the gentlemen, who are well capable of preserving the teeth by their methods. The main point that I believe imbues Dr. Johnson in the writing of this paper, and that imbued me in the writing of a similar paper a year ago, is to have the profession try to reach a proper conclusion, so that students could be consistently taught. Nothing struck me more forcibly than the remarks of Dr. Darby, in which he distinctly stated that he taught a method different from one which he has been practicing during the past thirty years. As a student of Professor Darby, whose teaching I shall ever revere, I feel (in a Pickwickian sense) under the greatest obligations to him that he taught me the method he did not practice, because I should regret it very much if I were practicing during these years that method which I attempted for a while and then discarded—very much to my satisfaction at the present time.

I do not believe this can ever become a worn-out subject. Although the question of preparation of cavities has not been gone into by the essayist, but has been taken up by all the gentlemen present, I want to bring out a point that came up at the Brooklyn meeting two years ago, when the subject was the question of "extension for prevention." At that meeting I made the assertion and championed the fact that although in his time Marshall H. Webb never presented the subject of extension for prevention in the lucid manner presented by Professor Black in his writings, he did teach

that method. The methods taught and illustrated by him differ very little from Dr. Black's work, one of the small differences being the objectionable features of retaining points.

I have the pleasure of presenting to the society tonight two of the original models made by Dr. Webb, which Dr. Kirk, dean of the Dental Department of the University of Pennsylvania, kindly loaned me to show at this meeting. They are Dr. Webb's own handwork. The cavities were cut out by Webb, and from these models were drawn the illustrations in his work on operative dentistry. In passing these around, I want to distinctly call your attention to the flat seat at the gingivo-labial and gingivo-palatal walls.

If the cause that Dr. Webb fought for is right—if it should be proved in the future that cohesive gold, from beginning to end, is the ideal filling—I look upon him as bearing a position to dentistry similar to that which Abraham Lincoln bore to the republican party in this country. I look upon him as a man who died a martyr to this cause, and one whose memory, if he fought for the correct principles, is one that this profession should ever revere.

In the points brought up by the essayist there are a number of questions that I will try rapidly to dwell upon. It has been almost tacitly admitted by the essayist, and by the other speakers—outside perhaps of Dr. Perry, certainly by Professor Starr—that a filling made of cohesive gold from beginning to end is more homogeneous and is consequently, if made in an ideal way, a better preservative of the tooth. I claim that this idea of saving time by filling the gingival third with non-cohesive gold is one we have no right to consider, if it be done for that purpose. If it be our duty to save teeth, and to save them if possible for a lifetime, the question whether that kind of an operation is going to take one hour or at the most an hour and a half longer than an inferior and less substantial form of filling, is one that at any rate we ought to leave to the patient to decide if he can be made to understand the question. I deny that the operation

is more laborious, as far as the operator is concerned, if he has studied well the methods and the ease with which cohesive gold can be inserted. I believe, however, that this "bugaboo" of the difficulty of inserting cohesive gold foil, making it such a formidable operation, is due to various reasons, which I would like to clear up. Professor Black, in 1891, in an article in the *DENTAL COSMOS* makes use of a sentence which is extremely trite. He speaks of the scientific knowledge that is being used in the education of dentists, and then rounds up with this warning in a single sentence: "We need to have a care that we do not lose in that manipulative skill for which we, as Americans, have become noted."

It is this skill in the use of cohesive gold that makes the operation not much more laborious than one of pellets or ropes. I deny that cohesive gold can be properly inserted with pellets or ropes or any such form in a proper or easy way, and the best results can only be attained when the gold is used as rolled gold or as foil.

Cohesive gold used properly answers the instrument almost as readily as water running down-hill; but to get that service of it requires that the gold should be kept at all times in the purity in which it comes from the manufacturer; and the instruments with which it is manipulated should be in a polished condition. These points if followed out make a great difference in some of the arguments brought up against the use of cohesive gold. For instance, the essayist says that if cohesive gold be malleted upon to a certain point, after we get what is known as the anvil tone—"if malleting be then proceeded with, it will lose its cohesive quality." That has been said for years, and I deny the correctness of the assertion. I claim it is utterly impossible to lose this cohesive property if the gold be kept perfectly clean and the instruments undefiled.

In order to fully satisfy myself on this point I made the following experiment under the severest conditions to which gold can be subjected. This was done in my office with Dr. Reitz present with the

electro-magnetic mallet giving about 3700 blows a minute. When the filling was nearly completed we used the plugger for over ten minutes at the same rate. I became so tired that Dr. Reitz used it part of the time; at his suggestion we used, at the finish, a plugger that was as smooth as any burnisher; so we had a perfectly burnished surface when we completed the operation. I will admit that when the first piece of gold struck the burnished surface it appeared for an instant as though there were a lack of attraction; but it was for an infinitesimal period, and then the cohesion proceeded exactly the same. I purposely performed this operation in the presence of Dr. Reitz so that there would be no question of the correctness of the assertion. I simply wish to destroy one of those supposititious axioms of dentistry which I claim has no existence, by a test more severe than could possibly occur in the mouth.

One of the points the essayist brought up was that in all cohesive gold fillings of this character it is a common thing for me to fill half of the cavity with gold, and finish that perfectly—in the manner so well stated by Dr. Starr as that in which he finished his cavities—before reaching the point of contact; but instead of completing the filling, when the gingival half was polished I would dismiss the patient, after covering the gold with gutta-percha, and at the next sitting, after simply burring the surface of the gold, commence with the mallet, and thus complete the operation. This is not only a fact, but in extensive restorations of posterior teeth I have divided such operations into as many as six sittings, so as to avoid too much strain on a certain class of patients.

The essayist in his paper questions whether there is perfect cohesion under such circumstances. This is simply an illustration of what I claim—a remarkable lack of knowledge in regard to what can be done with cohesive gold. He decries this as making two bites of a cherry. That is not the case at all. In most of these fillings that we meet with, both teeth have cavities. Take two bicuspids

approximal cavities, or a bicuspid and molar: as a rule there are approximal cavities, distal and mesial, and in the same time it would take to fill one entire tooth I prefer to fill the lower half of both teeth and finish those surfaces perfectly. Why? When they are filled with cohesive gold at the lower third or half perfectly, before proceeding farther, that part of the filling can be put in a condition that, next to a piece of porcelain, is the closest thing that resembles the natural enamel of the tooth—much more so than any condensation of non-cohesive foil can ever be made. This can never be done so well after the point of contact has once been made. If you have studied macroscopically the anatomy of the central portion of the approximo-gingival surface, you will call to mind the concavity that exists between the distal and mesial angles of the tooth in this region. How often is that polished perfectly with the margin of the tooth at the cervical border?

If many operators who leave the polishing of the gingival third until the filling is completed would have the opportunity of examining them afterward, I question if they would be satisfied with the condition at the cervical margins. Stop and realize how easy it is to thoroughly polish the surface before the contact points have been made. The approximal gingival half of both teeth can generally be filled at one sitting, and both can be completed at the next operation, or at two succeeding operations. This will serve to illustrate that there is not the great loss of time that has been spoken of by the essayist.

In a criticism of my views on this subject in the *International Dental Journal* of this month, which I have not the time this evening nor is this the place in which to answer, one point brought up is the one which I advocated in the September number of that journal, about starting the gold. Taking the cavity as prepared by the essayist, I deny that in an all-cohesive gold filling it is necessary to use starting points, or to cut as much of a groove in the dentin as Professor Starr has shown; you can insert a small amount

of zinc oxyphosphate not much larger than the head of a pin, placing it along the gingival seat, or as Professor Wedelstaedt prefers to call it, the gingivo-buccal and gingivo-lingual and gingivo-axial angles. The gingival floor is now plastered over with a little cement, running up the axial wall, not thicker than you would use to put in a porcelain inlay. Into this soft sticky cement is now placed a small amount of the soft cohesive gold similar to the Solila or the "moss fiber." This can be very delicately compressed all around the inner periphery of the tooth, and we get a surface that is exactly similar to what has made the porcelain inlay such a satisfactory thing in dentistry. We get a surface of cohesive gold inlaid and adapted to the most important and dangerous portion of the wall—the gingival seat, and the gingivo-axial angle inlaid there as perfectly as any porcelain inlay ever was. The foil is then malleted directly on to this surface. When the operation is finished we have one homogeneous piece of solid gold more dense than any cast gold.

There is not a gentleman who has taken the floor who will deny the fact that the more homogeneous, the more solid the filling is, the more it will be able to withstand the stress of mastication. We know how that stress varies in different persons. This experimental filling that I now show and pass around I made last night; it was done outside of the mouth, and was an approximo-occlusal filling supposed to be in a molar. It was built half way as I have just described. It was then put in water and allowed to remain one hour; then it was smeared all over with vaselin. It was then cleaned off with alcohol and chloroform, the superficial surface was dressed off with a bur, and the operation completed. I defy anyone to break it at the point where the vaselin was rubbed over the joint, or to break it in any place. I also want to say, in that respect, that I sent the filling this morning to Dr. L. Saarbach, an analytical chemist of this city, to have its specific gravity determined and I received his attested report that it has a specific gravity of 19.87.

In the exhaustive articles by Dr. Black, the highest specific gravity obtained was 19.42, and in that series of articles he mentions the fact, which has been mentioned since by Wedelstaedt, that by means of the electro-magnetic mallet not more than 13.2 specific gravity was able to be reached. This brings up the point of personal equation; it is the man who does the operation who accomplishes the result. There are different ways of doing the same thing. In Black's record of experimental fillings, some unknown man who presumably did not understand how to use properly either cohesive gold or the electro-magnetic mallet turned out three fillings the highest specific gravity of which was 13.2. It is a fact worthy of a little reflection that the filling now passing around was inserted in the ordinary manner and in the presence of two other dentists and has the attested specific gravity of 19.87.

As Black's highest record of specific gravity is 19.42, am I too presumptuous in claiming that gold can be packed more densely by means of the electro-magnetic mallet than by any other means? It does seem that the weight of scientific evidence points to the fact that gold fillings in approximo-occlusal surfaces of the posterior teeth, supposing they are properly inserted, are durable and lasting in proportion to their density. If this be true, it likewise follows that an all-cohesive gold filling is more dense than one partially composed of non-cohesive gold.

If these premises be correct, it follows as a natural conclusion that an all-cohesive gold filling should be taught to students, rather than the one described to us by the essayist.

Dr. L. D. SHEPARD, Boston. In 1876, at the meeting of the American Dental Association in Philadelphia, I put upon the blackboard a diagram showing why cohesive gold resisted the effort for consolidation. In all the discussion since that time, owing perhaps to a little misunderstanding on the part of some in regard to cohesive and non-cohesive, or soft and hard gold, I felt that perhaps it had not been appreciated, and I will

reproduce the drawing upon the blackboard now. [Illustrating.] If we could make a mat, a cylinder, or a rope of gold, in which the laminae—every one of them—would be absolutely parallel to one another, without any irregularities of surface, with force applied upon the top of twelve layers, we might think that force would be felt at the twelfth layer rather than find its termination somewhere in the interior; but when we have a gold which is in a wavy form, in that way including air-spaces, with contact points here and there scattered promiscuously through the mass and force applied upon the top, we get what?—[demonstrating]—the principle which in all architecture is considered the most resistant to crushing; that is, the arch. Every rope of cohesive gold, or every cylinder of cohesive gold, where the surface of each lamina is attractive, will join to its neighbor, and in that way produce a series of arches and curves with air-spaces which make it impossible to reach the under surface, which in the art of hardening is called case-hardening. That you will find at some length in the transactions of the American Dental Association of 1876. If you will carry this out with a well-drawn diagram you will find fifty points of contact, spaces between, and arches and air-spaces.

It was my fortune, in fairly early life, to be associated with Dr. Joshua Tucker of Boston; my association commenced in about 1866. Many of you know the reputation of Dr. Tucker. I will assert here that it was the rule of Dr. Tucker and his school that the mouth of the cavity should be larger than any other point. Diagrammatically it is expressed in this form. [Illustrating.] If possible, Dr. Joshua Tucker and his school never allowed the base of a cavity to be of the same diameter as its mouth. This I assert as a fact. The reasoning was that in the matter of consolidation from the surface, using soft gold, every accession of condensation drove the filling a little tighter against this obtuse wall, and that in fillings on the grinding surfaces the stress of mastication year by year made the filling tighter than when inserted.

Another argument which has not been brought out—but which should be taught by all teachers and should be insisted upon—is that there was never a cavity made the walls of which were microscopically smooth. Put a microscope there, and instead of a straight wall you get an irregularly curved surface that you doubt the possibility of hermetically sealing.

In attestation of that fact and of the method of Dr. Tucker, I have removed multitudes of fillings, among them dozens of fillings that have been put in by these older gentlemen, and I can show you where, after I removed the gold, there remained the bottom layer, the first layer of non-cohesive foil, which has held its position in contact with the wall of the cavity, not coming away with the mass of the filling. Such was the force of impaction, and such was the nature of the gold, that they drove the surface of the first layer of gold so into the interstices that, when the filling was removed, the first layer stuck there as if it had been put in with glue. One I had recently was made by Dr. Tucker fifty years ago.

Another point I noted was this: In my practical work, while for many years I have always followed the method of the essayist and of Dr. Perry, I have modified it in this way—and have thereby secured better results, I believe—by the substitution, for the first third or perhaps a modification of the first third, of tin for non-cohesive gold in the position the essayist referred to. I have multitudes of patients of twenty, twenty-five, or thirty years of age who have tin fillings in their first molars, inserted as five- or ten-minute operations at the age of seven or eight years, which I have not removed during the intervening years for the reason that, with the exception of slight wear on the surfaces, there has been a perfect preservation of the tooth.

In the filling of the tooth at this portion, on the palatal or lingual corner I use tin. With this particular point, where it may come into view, I may introduce gold in connection with it, and I

build that up, as the filling which in my opinion is superior to any form of gold which ever was manufactured in its tendency to preserve tooth-structure when placed in contact with it.

The additional advantage is that you have a soft metal which by means of acute-angled cutters you can trim off beautifully at the margin, obviating the use of files or hard instruments, and making a most satisfactory finish to the work.

Dr. PERRY. I have nothing further to say in discussion of the paper, but I am not willing to keep my seat and not say to the gentlemen that in regard to the cast which Dr. Rhein has shown as having been prepared by Dr. Webb, cavities were prepared in that same manner by Dr. Varney before Dr. Webb even entered the profession, and I think were described by me (Dr. Varney himself was not a writer, and would not put forth his work) before, I think, Dr. Webb was even a student—prepared precisely like those excepting that Dr. Varney's method was a little more like Dr. Johnson's method today in that they would widen out a little more near the cervical border, and were not quite so freely cut away as they approached the grinding surface. Dr. Northrop, Dr. Hodson, and Dr. Delos Palmer will confirm what I say, and I think also Dr. Littig. I cannot sit here and not do justice to that little man, Dr. Varney, who mapped out for us that preparation of the cavity which stands today as the best for the use of cohesive or non-cohesive gold.

Dr. RHEIN. I may have been misunderstood in the tenor of my remarks. I do not desire to convey the impression that Dr. Webb was the originator of any of the methods described. I am a firm believer that all our work is one mass of progressive evolution. I am very glad to have Dr. Perry make this introduction of Dr. Varney's name in reference to the matter. The one point I made in regard to Dr. Webb was the untiring missionary work which he pursued in instructing the profession throughout the entire world, without regard to his own personal interests, but animated solely with the de-

sire of teaching how easily cohesive foil could be manipulated, and showing his method of doing the work.

Before taking my seat, I want to state one point which I consider of vital importance, and which I failed to mention. In this day, when we are beginning to recognize so fully the value of dental prophylaxis, the repeated cleansing of patients' mouths, where they have this character of filling, and the introduction of sharp instruments around the gingival angles, will frequently show the bad effects of such instruments on fillings where the gingival third has been constructed of non-cohesive gold—effects that would be impossible were they constructed of cohesive gold. I want to add this to my argument.

One final point: The essayist, in his valuable work on operative dentistry, has drawn wider attention than I believe any writer ever did to what we know so well as the period of immunity in life, when it is almost impossible for caries to proceed. Gentlemen, this period of immunity hides a wonderful number of poor fillings.

Dr. PERRY. I did not mean to criticize Dr. Rhein's statement. I simply wanted to do justice to the memory of my dead friend. I agree entirely with Dr. Rhein that Dr. Webb killed himself for the sake of the profession.

Dr. JOHNSON. I want to thank those who have taken part in the discussion for the leniency they have shown me in their treatment of the paper. I also feel highly complimented in the fact that so many have come here from a distance. I take that as a tribute, however, to the anniversary of the New York Odontological Society.

I shall not discuss the remarks of anyone except a few words as to some of the statements made by Dr. Rhein. When he speaks of the fact that repeated blows of a rapidly acting mallet on the surface of gold do not affect cohesion, I acknowledge that I have not experimented out of the mouth as he has done. I give my clinical observation, and what is demonstrated to me in the mouth is the basis upon which I form my judgment. It

has been my experience, that if I allow a rapid mallet to play too long on the surface of gold the next piece behaves precisely like the piece that he mentions after having malleted ten minutes; when it touches the gold it does not seem to like to take hold of it. Am I right in that statement?

Dr. RHEIN. Yes.

Dr. JOHNSON. That is an intimation to me that the cohesive property of that gold has been interfered with to a certain extent, and if I can get a uniformity of behavior in the gold by another method, where there is not that moment of hesitation to give me doubt, I prefer the other method, because I have greater assurance of success. I have no argument against Dr. Rhein using the rapid mallet. I believe every operator of judgment should have the privilege of doing work by the method which gives him the best results; I think it would be a dark day for dentistry if we all did the same thing in the same way. There is the matter of personal equation that we cannot ignore, and these slight differences have been the saving grace of dentistry.

Just one other point that he mentioned, in regard to making several operations for the insertion of a gold filling. He went even farther tonight when he said that if he had two approximating cavities, he would fill probably the gingival third of both cavities and dismiss the patient, instead of completing one operation. There is such a thing in the performance of an operation like the insertion of a gold filling, as poetry, such a thing as rhythm, and when I start a filling I want to complete it while that idea is in my mind. When I begin that operation, the perfected filling is before my vision all the time, and my fingers play to that end, and they do it much easier than if I stopped and broke the harmony, and began another operation.

While Dr. Rhein may secure the best operation by his method, for me it would not answer. I should prefer using the time for finishing up that one filling while I have that vision in my mind, and then to set up another ideal next time for

the other filling and complete that ideal at that time.

There is more poetry and art and inspiration mixed up with our operations than we have any idea of. If we do the best for our patients, there is an artistic element in it, and I should feel sorry for the operator who ignored it. If I did not have that idea in my soul I could not stand over patients day after day and do all this laborious work. The kind of operation outlined by Dr. Rhein would destroy that idea in my mind and make it mere mechanics.

I have a word of thanks to the officers of the New York Odontological Society. I conceive it to be one of the greatest honors of my professional life to come to the anniversary meeting of this society and read a paper.

The PRESIDENT. On behalf of the New York Odontological Society, I want to say to Dr. Johnson, that the debt of gratitude is all on our side.

Adjournment to banquet hall, where a collation was served.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

NORTHEASTERN DENTAL ASSOCIATION.

Ninth Annual Convention.

(Continued from page 233.)

The PRESIDENT. I take much pleasure in introducing Dr. ALBERT L. MIDGLEY of Providence, R. I., who will read a paper on "Syphilitic Lesions of the Mouth," illustrated with lantern slides. (Printed in full in the March issue of the COSMOS, at page 200.)

Discussion.

Dr. W. H. POTTER, Boston, Mass. It gives me pleasure to speak a word on this valuable paper, and that word will be along a practical line. It may be said that it is very well for men connected with dispensaries and infirmaries to study this question, because they come in contact with such lesions, but that we who have select practices are not likely to meet them. Such reasoning is, however, false. Statistics show that syphilis is not confined to any one class in a community, and that therefore it appears in our most select practices and must be reckoned with. Moreover, the well-to-do patient, when suffering from this disease, is likely to be put immediately under careful treatment, and the lesions are more likely to be disguised than with poor people, and for that reason are more

difficult to discover. The practical point I want to express is this: Treat all patients as if possibly infectious, and care for your instruments accordingly.

Dr. GEORGE T. BAKER, Boston. I think this is a most interesting paper, and one of practical use to us. I remember when I went to the dental college we had some talk on this subject, and the professor, who is now dead, said nothing of the prevalence of the disease. I made it a point to ask him one day about the prevalence of this disease, and I remember that I obtained no satisfaction. That was twenty years ago, and I have never heard anything since about how prevalent this disease is. It is very easy to find out the number of cases of pneumonia, diphtheria, measles, etc., by referring to the pamphlets published by the boards of health, but I find in my investigation of this matter that it is very difficult to get at the percentage, because of the fact that there are practically no statistics regarding it; and there are no statistics on this subject for the reason that the facts are obscure and many cases exist of which no report is ever made. At the same time, is it not reason-

able to believe that this disease, which is the most contagious disease there is, is much more prevalent than diphtheria, scarlet fever, etc.? I think this is a very important phase of the subject, and there should be some way of knowing the prevalence of this dreaded disease. And so I say that this advice that we have had given us in the paper, and supplemented by Dr. Potter, is very timely. We should be very particular in the use of our mouth-mirrors and other instruments with which it is possible to carry this infection.

There was another point brought out in the paper with regard to the elimination of the disease. It used to be thought that syphilis was different from other diseases, and that a man who was afflicted with it was a syphilitic for life. It is different with regard to this now. This disease is subject to the same laws as are other diseases of the systemic character, and the conditions can be eliminated under proper treatment. Of course in a person with a very weak and delicate system who becomes afflicted with this disease, the system cannot stand the strain and the patient perhaps will not respond, but there are a great many cases where the disease is eliminated, and I believe eliminated thoroughly.

Dr. A. J. FLANAGAN, Springfield, Mass. There are a great many phases of this question that could be discussed with great profit not only by practitioners of dentistry, but by practitioners and operators on every part of the human body. Now, taking one phase of it, as Dr. Potter states, it is a well-known fact that in surgery—scientific surgery—the surgeon treats everyone as a person who is possibly infected. If we accept this conclusion, what are we to pursue in the line of operation with regard to sterilization? Take the hospitals throughout the country; we do not find them sterilizing instruments by the use of simple warm water, or with the formaldehyd sterilizer; they are not depending upon any of these means, they only depend on steam in some form; and why? It is a well-known fact that you cannot sterilize in the best possible manner without using steam in

some form. Year after year we have gentlemen in the dental profession who give us papers on the ethics of one dentist to another. Now, there is a higher ethics than that—the ethics of the relation of the dentist to his patient. If science has developed the fact that sterilization, to be most complete, can only be accomplished in a certain way, then no dentist can be ethical unless he takes the ground of sterilizing his instruments along that line.

In the city of Springfield we have had some experience with the formaldehyd sterilizer. We have made it a point, in conjunction with Dr. H. C. Emerson, bacteriologist in one of our city institutions, to conduct a series of experiments especially from the standpoint of sterilizing dental instruments. We found that sterilization by the formaldehyd sterilizer could not be depended upon. We found that by taking a broach or a barbed instrument, introducing it into a putrescent pulp-canal, then mechanically cleaning it as well as possible and putting it into the formaldehyd sterilizer for from fifteen to sixty minutes, we were able to get a culture. We have found the same with regard to burs, perhaps the most difficult of all instruments to sterilize. Now, the only way we can be sure of these things is to conduct experiments on similar lines and thus determine the best methods of sterilizing dental instruments, and I trust that hereafter, when it has been determined by scientific methods that perfect sterilization can only be performed in a certain way, we won't have men jumping up in a society and saying they can sterilize instruments with warm water and a piece of cloth.

Dr. JAMES McMANUS, Hartford, Conn. I think we all enjoyed the paper very much, and I think it has opened the eyes of all of us to the dangers we are working under. I appreciated very much Dr. Potter's remarks, because he told us what some of us have not realized, that we are in danger even when we least suspect it. Every town and every city has a board of health, and they have very stringent laws to carry out in regard

to other contagious diseases, each physician being required to report every contagious disease found. Now, it would be a great help if we could get them to realize the importance of reporting this disease. It is considered one of the worst that can afflict humanity, and we are in no way guarded against it. Fortunately we have in our city a dentist appointed on the board of health, and he has been able to carry out a movement to have the mouths of school-children examined. I do not believe that, as a rule, dentists realize the importance of this question.

There is one other point that I would bring out; that is, that of all the instruments in our possession we should have more mouth-mirrors. I do not think that an office is well equipped where there are not a half-dozen mouth-mirrors; in that way we can change them frequently and keep them clean.

Dr. N. MORGAN, Springfield, Mass. This is only a sample of the discussion that has been going on for years with regard to the sterilization of instruments. I have been interested in this line for some years, and I have seen the difficulties that the manufacturers in getting up a sterilizer have to contend with. One of the great difficulties has been in the handles, and some years ago I originated a handle that could be easily cleaned and sterilized without the process affecting it. This was submitted to the manufacturers, and their reply was that they did not think it feasible, as only one dentist in ten made any attempt whatever at sterilization, and that one did not attempt to sterilize the handles. The dentists have been largely responsible for not having a perfect process of sterilization, because they have not demanded it. The best thing to do is to do the best we can until the problem is solved and we have a sterilization process that will be reliable, and one that we can trust.

Dr. BECKFORD. I would like to ask if the state laws are not against the professional man in regard to this disease. Is it not true that we are likely to be fined if we make it known that a patient has this disease? Why I mention this,

at the time I was in college a man in New York was put in jail for merely mentioning the fact that a patient had syphilis.

Dr. G. A. MAXFIELD, Holyoke, Mass. I think we can all remember a case which occurred in London within the last three years in which a prominent surgeon told his wife that a certain person was suffering with this disease, his wife repeated it, and it came back to the patient. The surgeon was sued, and had to pay several thousand dollars.

Dr. ROGERS. The essayist in speaking of local treatment in syphilis mentioned the use of an astringent mouth-wash containing tannic acid as one of the ingredients. Dr. Grady of Annapolis, Md., discovered in experimenting on an astringent mouth-wash that one ounce of listerine would take up one ounce of tannic acid, and that makes a very strong astringent mouth-wash, which I think would be efficient in troubles of this kind.

Dr. E. F. BRACKETT, Boston, Mass. In the matter of sterilization I have had a great deal of satisfaction in the last few years from the use of a simple apparatus suggested by Dr. W. H. Potter. It is a small apparatus in which a formaldehyd tablet is vaporized. The objection to most sterilizers is that they leave the instruments coated, and this is very easily avoided by simply wrapping the handles loosely in paper. It is an extremely simple apparatus, and very inexpensive, and I have implicit confidence in its efficiency.

A MEMBER. With regard to the matter of sterilization, I have found good results from the use of mercury bichlorid. I first wash the instruments, and then immerse them in a solution of mercury bichlorid and hydrogen dioxid, equal quantities. I do not think that this is the only way of sterilizing instruments, as I have a formaldehyd sterilizer, but I like the bichlorid solution because it is easily used.

Dr. MAXFIELD. Dr. McManus has just suggested that often dentists sterilize their instruments and lay them on a table from which they may be contaminated.

I use on my operating table a cardboard cover glazed on both sides. After the first patient this is turned over, and after the next it is discarded, and a new board placed on the table. I have these boards cut the size I wish, and find them very inexpensive, as they cost only about fifty or sixty cents a hundred. By the use of them I am assured of a clean surface on which to lay the instruments.

Dr. GEORGE T. BAKER, Boston, Mass. In the sterilization of instruments I have used boiling water to a great extent, and by so doing I have destroyed a great many instruments, so that lately I have adopted a cold solution of formaldehyd, in which I throw my instruments after using them. I put about one and one-half teaspoonfuls of the forty per cent. solution of formaldehyd to the pint of water, and to this is added about two teaspoonfuls of sodium carbonate to prevent the instruments from rusting. My instruments are thrown into this and allowed to remain at least half an hour. It is the best disinfectant for instruments that are not injured by being wet, and besides thoroughly disinfecting them it also cleans and polishes them, for after remaining in the solution for about half an hour they are washed in boiling water and then carefully wiped dry. For such instruments as are injured by being wet, the dry formaldehyd gas is used in an oven, the paraform being heated over an alcohol lamp which is especially prepared for that purpose.

Dr. MIDGLEY (closing the discussion). I wish to say that I very much appreciate the elaborate discussion of the paper. The importance of sterilization and the early recognition of these lesions has been so very well brought out by Drs. Potter, Baker, and others, that there seems to be nothing left for me to say upon that point. I believe Dr. Baker asked about the frequency of this disease. A year ago I read an article by an eminent authority on this subject in the *American Medical Journal* in which it stated that in New York city one in every fifty-six persons was afflicted with syphilis. In closing, I wish to thank you for your kind interest and attention.

On motion the society voted its thanks to Dr. Midgley for the paper presented.

Dr. BOARDMAN, chairman of the Nominating Committee, then made the following report:

President—Dr. Henry McManus, Hartford, Conn.

First Vice-president—Dr. Thomas J. Barrett, Worcester, Mass.

Second Vice-president—Dr. Thomas Mound, Rutland, Vt.

Secretary—Edgar O. Kinsman, Cambridge, Mass.

Assistant Secretary—Charles F. Krepel, Jamaica Plain, Mass.

Treasurer—Edward B. Griffith, Bridgeport, Conn.

Librarian—Charles H. Riggs, Hartford, Conn.

Editor—David W. Johnston, New Haven, Conn.

On motion the rules were suspended and the secretary empowered to cast one ballot for the entire list of nominations.

Motion to adjourn was made and carried.

THURSDAY—Afternoon Session.

The meeting was called to order at 2.30 by the president.

The first item on the program was a paper by Dr. WILLIAM H. POTTER, Boston, Mass., on "The Care of the Teeth of the Sick Poor." (Published in full in the January issue of the *Cosmos*, at page 9.)

Discussion.

Dr. S. A. HOPKINS, Boston, Mass. I think Dr. Potter has so well stated the situation that there is very little for me to add, except to urge the co-operation of dentists generally. We have found at the Tufts School that we are handicapped in that we have but a few men in the senior class who have passed their state board examinations, and therefore the number of students that we can send out is very limited. Perhaps if some concessions were made in this direction by the state board—I do not advocate it, but merely suggest it—so that students could go out under the direction of the head of the infirmary, the work could be

enlarged. At the Tufts School we not only have a great many cases of this kind, but we also have cases, perhaps a little less urgent but of equal importance so far as ministering to the comfort of the patients is concerned.

We have a number of people in the homes for old men and women that we visit, and a number of children in orphan institutions, and I cannot express to you what a comfort it is to some of the old men and women in these institutions to have a set of artificial teeth made. I have seen many disturbances from indigestion, extreme nervousness and irritability of temper, all pass away and complete comfort follow the insertion of a well-fitting set of artificial teeth. But there comes in this connection another point to be considered; that is, that neither of the schools are sufficiently endowed to take all these cases of artificial teeth, or cases of any considerable amount of work which involves expense. We are not in position to give these services very liberally, and what we need most of all is an endowment fund that will give us an income of two, three, or four thousand dollars a year, so that we may use our dispensaries for the greatest good to the greatest number. I know of no charity that can be of more physical and moral good than charity of this kind.

It seems to me sometimes as if the appreciation and the care of the teeth was the best indication of civilization that we have. It used to be the bathtub that indicated a person's position as to culture and refinement, but I think now that the appreciation of the teeth marks more nearly a person's status in society than any other one thing. I think that the care of the teeth of children will do an infinite amount of good toward stimulating the child to a better appreciation of his position in life, and will stimulate him to higher efforts.

And so it is that physical impressions affect the moral character. You know the experiments in the Rochester prison where they tried the effect of military exercise on the prisoners. They took those shrinking criminals and made them throw their shoulders back and hold their

heads erect and step out with a firm steady stride, and in every way improved their physical condition, and that was the beginning of their moral reform. In this way they learned self-respect and their moral reformation was begun. And in the same way will the care and appreciation of the teeth stimulate the moral nature of the poor.

Dr. Potter spoke of the care of the teeth of the sick poor. Some time ago I did a little work in bacteriology—recently published—that had a bearing upon this subject. I will not bore you with the details of the work, but it was to this effect: I took three or four different germs that are common in the human mouth, one of them being the bacillus of croupous pneumonia, for my experiments. These bacteria were found in the mouths of people who took no care of their teeth. I tested these on dogs, mice, and rabbits with regard to their virulence. I had the mouths of these patients cleaned very thoroughly for two and three weeks, and at the end of that time I found in many cases that the germ had entirely disappeared, and in those cases where it had not disappeared it was so weakened in activity that it had practically no effect upon the animal inoculated. This simply shows that care of the mouth will reduce the virulence of pathogenic germs which are found commonly in the human mouth. This is particularly true of the pneumonia bacillus, which is found in about twenty per cent. of normal healthy mouths.

In this connection, knowing that pneumonia follows diseases like measles, whooping-cough, and many others, and is in a measure dependent upon the weakening of the system from these diseases, I wish to bring out the practical point that when a patient is ill, if the nurse cares for the mouth properly, and keeps the mouth clean, there will be no trouble in preventing this disease from following. In the care of the sick poor, this seems to me as one of the points that we might insist upon, and encourage our students to look after these unfortunate people, who have not the advantages that we have.

Dr. A. L. MIDGLEY, Providence, R. I. I fully agree with Dr. Potter in saying that a great amount of good can be done by the dental profession in this way. I also believe, as Dr. Hopkins stated, that a thorough hygienic condition of the mouth is an important factor to be considered in the prevention of the diseases of childhood. I think also that a great deal can be accomplished in the way of preventing and correcting irregularities of the teeth by following the lines indicated by the essayist.

There may be no financial reward for doing this kind of work, but it is a charity, and it must be a source of pleasure for us to know that we are helping a deserving patient and at the same time elevating our profession. During the past two years I have been doing this work at one of the orphan asylums in our city. Five or six visits a month were made, and extraction and such other operations as would relieve pain for the time being were resorted to, and I must say that the results obtained and the appreciation shown repaid me well for the time given the institution.

Dr. DOWSLEY. Our profession has been criticized because we are not doing anything for the poor, and I think the criticism is a just one. The medical profession is ahead of us in that regard; some of the leading practitioners in this city devote a considerable part of their time to work of this kind in the hospitals, but we do not find the dentists doing the same. This is a field in which we could do a great deal of good work.

Dr. D. H. ALLIS, Springfield, Mass. In New York they have quite a number of the leading practitioners who give certain evenings at the hospital for this kind of work. Cards announcing this fact are sent out to those who are worthy of charitable work, and they come to the hospital for care by these dentists. Of course no extended operations are performed, only plastic fillings, and relief of painful conditions, also some regulating of teeth. They are given instructions with regard to the care and cleaning of their teeth, and you would be surprised to see how readily they take

hold of this work. The majority of them profit by the instructions, and a great number take advantage of the opportunity to have this work alone. Of course there are a great many who try to take advantage of this opportunity to have charitable work done who are not worthy charitable patients.

Dr. DOWSLEY. We are all interested in what is being done in other parts of the country. There has been a movement on foot in this connection in this city for the past two years to provide dental services for the children in the charitable institutions. There is no provision made for the care of their teeth and mouth, and the only attention they receive is some extracting by the house officers. There is a bill before the legislature, and has been for the last two years, providing for the appointment of dentists by the governor to attend to the people in these institutions. Quite a number of the prominent practitioners of our city have personally gone to the House and indorsed the bill and made endeavors to have it passed, and we hope to get it through this session.

On motion, Dr. Potter's paper was passed, and the society listened to a paper from Dr. LEO GREENBAUM, Philadelphia, on "Neurasthenic Manifestations in the Oral Cavity." (Published in full in the February issue of the COSMOS, at page 96.)

Discussion.

Dr. JAMES McMANUS, Hartford, Conn. The papers that we have had the pleasure of listening to yesterday and today teach us the difference between the dentists of the past and the dentists of the future. There was a time when dentistry meant simply extraction and filling and making artificial teeth. I believe that is the definition some of the dictionaries give to the word dentistry. But after listening to the papers that we have had the pleasure of hearing in the past two days, and especially this one by Dr. Greenbaum, we realize what a tremendous responsibility rests on the dentist, and how often, if he is observant and has taken the pains to study the litera-

ture of his profession, he may be of great benefit to his patients.

With regard to Dr. Greenbaum's illustrations, many of us have seen similar cases to those mentioned. I have had the good fortune at different times in my life to recommend patients that I felt were in need of systemic treatment to go to physicians, and in two or three instances the patients have come back to me and asked me how I knew that they needed systemic treatment. I did not know, to tell the truth; it may have been intuitive knowledge. I did not understand anything about the saliva, as compared with the knowledge of the present day, but I had observed conditions of the oral cavity enough to notice that they were different from what they should be, and I sent them to physicians, who I thought could tell more than I could. In the present day the dentist has a great advantage over the dentist of the past from the instruction in the colleges on these subjects, and from the great amount of literature on this subject, and he has the opportunity of listening to representative men from the different colleges giving their experiences. We have a good opportunity to learn more of these subjects if we will only attend the meetings of the different societies and listen with attention to the papers read, and we are not today the dentist as described in the dictionaries.

Dr. E. C. KIRK, Philadelphia. That the paper which you have heard from Dr. Greenbaum is extremely important it is hardly necessary to say; that is a self-evident fact. I have listened to it with a great deal of interest, and I am glad that Dr. Greenbaum has given his particular attention to this matter. It seems to me that the work which has been done by Michaels and those working with him is stirring up men on the question of studying the oral fluids, and I am very glad to see that Dr. Greenbaum has taken an interest in the matter. With regard to the topic of his paper I will first give my views regarding it. The term neurasthenia is one which it seems to me is analogous to the term pyorrhea alveolaris—it is one of those

terms intended to describe a condition by its symptoms. It is rather descriptive of the symptoms than of the disorder itself, and that is doubtless necessary at this stage of our knowledge, because we do not know exactly where we are in relation to these conditions. But, as I have intimated, it is important in these neurasthenic cases to study the oral fluids in relation to the neurasthenic cases, and perhaps it may interest some for me to give my own views after considerable work along this line.

I am more of the opinion that these cases of neurasthenia, as described by Dr. Greenbaum, are cases which have their fundamental origin in some nutritional error. He has shown by his paper that in nerve exhaustion, or what he calls excessive strain, certain waste products are evolved as the result of a malnutrition caused by this excessive work. But when we say "excessive work," we are using a relative term—*excessive*, more than it ought to be. That immediately implies that there is some standard for the individual in the way of nerve stress—a certain amount of pressure he should bear without difficulty. Now, some of these cases are interesting, and I want to call your attention to certain phases of the difficulty which I think you will immediately recognize, and I think Dr. Greenbaum will recognize, as neurasthenia. I had a man sent to me by a student who was unable to do anything for him because he was unable to bear pain on account of his nervous irritability. I had a talk with him. He was a big robust man, and if he had not said anything I should have said he was of a phlegmatic temperament. I asked him the cause of this trouble, why it was that he could not stand a small amount of pain. He began to tell me that he was unable to stand pain, and that he had had a great deal of trouble in his time. I told him I didn't care to inquire into his private affairs, but asked what was the nature of his trouble. He told me that he had had a difficulty with his wife. I told him that that was a common enough disorder, and asked him why he should worry about that; then he grew

confidential and told me the nature of his difficulty. It was not such a domestic disturbance but that, had he been of a different temperament, he would have reacted in some other way. And in telling me his troubles this great big robust man cried like a baby. Well, I said to myself, this man's reaction to this condition of course shows that he is carrying a greater burden of stress than he is able to bear. I examined his saliva—about which I will tell you later.

Another case of a man who came and asked advice about his physical condition: He was the president of an insurance company, and something had gone wrong—perhaps he had been dabbling in Steel. I did not care about that, but I thought if he was a normally constituted individual, with the influence he had and with the business capacity he must have had to attain the position he held, he would have reacted in a different way to the difficulty than by coming for advice and breaking down and crying in telling me of his troubles.

These were simply manifestations of neurasthenia. When I examined the oral fluids of these patients I found, as Dr. Greenbaum says, a marked aberration from the normal. When we find these characteristic aberrations, we find generally in these cases two things present. I mean oxalates of an alkaline base, notably sodium oxalate, also lactic acid salts. These latter are found in the saliva in any condition where caries is present, but in these cases there was no caries present, and as these were lactophosphates in the absence of caries, they must be accounted for in some other way. They are there as the waste products of nutrition improperly performed—abnormal waste products of nutrition, not fermentative products. You can find these salts in the saliva as it flows from the glands, before it has had a chance to form in the mouth. What is the consequence? We know that in the process of dissimilation both uric acid and oxalic acid—uric acid particularly—are products of dissimilation of proteid, and may be regarded as the coefficients of tissue waste.

It has been shown right here in this little village in which we are meeting, that muscular stiffness is due to the damming up in the muscular tissue of sarcolactic acid. The destination of this acid in the normal process of nutrition was not clearly understood until very recently. We knew it was made but could not tell what became of it. It was never found in the normal secretions. The chemist Minkowski accidentally stumbled upon what became of the lactic acid in making experiments upon geese in his search to determine the functions of the liver. When the liver of the goose was extirpated he found this remarkable thing, that whereas the normal goose excretes large quantities of uric acid in the form of urates in the normal secretions, as soon as the liver was extirpated lactic acid and ammonia were excreted in the quantitative proportion to form ammonium lactate. This discovery was interesting and important, because it demonstrated the fact that one of the functions of the liver was to convert this ammonium lactate into uric acid, and when the liver improperly performed its function we found these lactates forced back into the circulation. Before this discovery we suspected that this lactic acid was formed in the intestines, mouth, and urinary tract by the invasion of the lactic acid bacilli, but we now know that when these lactates appear in the stomach it points to an inefficiency on the part of the liver to perform its function. And in these cases where we find these nervous disturbances, you will find an excessive amount of lactic acid in the mouth and in the urine. When you find one of these characteristic neurotic livers you will find the saliva full of lactic acid. It is that sort of thing that makes me think that the affection of neurasthenia is due to malnutrition.

I admit that where we take a normal individual and submit him to excessive nerve strain all the tissue cells are more or less unable to perform their functions, and we have an accumulation of waste products—auto-intoxication—producing more nerve irritation. It is also true that lactic acid is one of the regular

waste products of the protoplasmic decomposition—that is, the product of dissimulation, and found in certain individuals.

Take the cases where the oxalates are characteristic in the urine and saliva. I want to call your particular attention to the fact that where this oxalic acid is formed they are not cases of oxaluria as described by the pathologists heretofore. Since Michaels has put into our hands the micropolariscope it has been possible to discover both the lactic acid salts and the oxalic salts, particularly sodium oxalates, and we are able to determine much more readily their characteristics than before. It seems to be true that it is a characteristic of this disorder of malnutrition that the waste products that we have in connection therewith follow each other in serial order. It is the tendency of the system to eliminate the alkaline salts first, and then the lime and magnesium salts. The existence of lime oxalates represents a later period of the disorder than sodium oxalates. The micropolariscope has simplified the work considerably, because before we had a chemical problem presented which was so complex that no methods of chemistry would enable us to determine these salts with accuracy.

Our methods of chemical analysis were insufficient to solve the problem, and it is being solved optically with the micropolariscope. It is now a question of keeping up the investigations and watching the results. We will be able to do what the essayist indicated; take a case and in a short time by microscopic and micropolariscopic investigations make out a clear record of the nutritional state of the patient. I must say that I am on the fence in this question. I don't know where we are at present, but I am glad that dentistry has taken hold of it instead of medicine—or rather, in advance of medicine, because it applies both to medicine and dentistry. I hope it will be the means of putting us in a position to see not only the nutritional state, but place us in a position to say what must be done.

Dr. GREENBAUM (closing the discus-

sion). I had a twofold object in reading the paper. One was to bring before you the importance of observing closely these manifestations in the mouth, and thereby be of use in advancing the profession; the other point was to present before you the extreme necessity of noting these manifestations of abnormal conditions, and of being the means of preventing them from becoming dangerous. I am very glad that Dr. Kirk has gone into the discussion at such length, as it is instructive to us all. He made the remark that the term neurasthenia is an indefinite term. My conception of the term neurasthenia is that it applies to a very definite something. It is true that laymen refer to all nervous patients as neurasthenics, but that is simply a condition which leads to the true neurasthenia. Neurasthenia is a condition where the nerve cells have reached a state of complete exhaustion, and are unable to react to external irritation. The nerve cells may show an excessive strain, but as long as they are able to react to a limited degree to external irritation, neurasthenia proper is not established. I simply endeavored to show you that in such conditions symptoms may be found in the oral cavity which will enable you to distinguish it in its early stage before it becomes dangerous.

I have not the opportunity nor the ability to investigate these conditions microscopically and chemically as thoroughly as Dr. Kirk, but I have familiarized myself with certain symptoms by which we can detect the danger in nearly every case. I will say in this connection that my interest in this subject was aroused by a conversation I had some time ago with Dr. Kirk, and which he has probably forgotten. We were on a committee together at one time, and while traveling we got into a discussion of the question of malnutrition, and the points brought out by him in that discussion led me to make observations of the results of malnutrition in the mouth.

Dr. KIRK. I did mean to convey the idea that the condition of neurasthenia was something indefinite, but as commonly used the term neurasthenia is

rather descriptive of the symptoms than of the disease itself. The same as with the term pyorrhea alveolaris, it does not describe the pathological conditions, but rather the symptoms of the conditions. Neurasthenia proper is not indefinite; it is very definite.

On motion the subject was passed, and the Committee on the President's Address made the following report:

The Committee on the President's Address beg leave to make the following report:

To further the President's suggestions, we would recommend that this society use all its influence to advance the interests of the Fourth International Dental Congress, and would urge each member to personally interest himself and to do all in his power to make the Congress a success.

We would suggest to each of the state dental societies of the New England states to take similar action at their next meetings.

We also most heartily indorse the President's wise suggestions regarding dental legislation and the unification of the dental laws of the various states.

JAMES McMANUS,
LUTHER D. SHEPARD,
GEO. A. MAXFIELD,

Committee.

Dr. HENRY McMANUS. I move that the report of the committee be received and accepted as read, and the committee retained as the committee to carry out these suggestions.

Dr. CHAS. W. RODGERS. With reference to the subject of reciprocity, I think the society ought to be very careful about going into reciprocity without a thorough understanding of what we are doing. At the last meeting of the National Association at Asheville a gentleman from one of the colleges in the south read a paper upon dental education and legislation, and in his paper he condemned the college man—that is, the man holding the B.A. degree. He seemed to condemn him as a man unfit to enter the dental profession, and that sentiment was applauded by a number of men connected with different schools. In the discussion afterward it was brought out by a great many men connected with other schools that they were in favor of high literary attainments. One man from Texas said that they were willing to pass men

through their state board who had not yet received the degree. In other words, they were anxious to pass men who had only one or two years' dental education in the dental colleges. His idea was that so long as they had prolonged the course to four years it was an injustice to men studying dentistry to expect, or require, high preliminary educational qualifications. Other men were in harmony with the idea that the four years' course was too long, and that it would tend to make men take their state board examinations before getting a degree from the dental colleges. It is a question in my mind whether any society in New England should recommend reciprocity with another state which has many men who have not a degree and many who probably have only a year or two of dental training. We should be very careful in taking any action in this direction.

THE PRESIDENT. The point is that we are dealing with the New England states entirely. The question of the college course or the length of the course does not enter at all. The New England state boards at the present time do not recognize diplomas from any colleges so far as exempting them from examination is concerned. A man who does not attend the colleges has the same privileges of examination and license if he has the ability. I cannot see that reciprocity in New England would affect the college course in other states.

Dr. RODGERS. The idea of my contention is that while we have no distinction between the man with a degree and one without, so far as permitting them to go before the state boards, still the sentiment of the law and of the boards is that they would prefer men with a degree to come before them for examination. The sentiment of some states seems to be that it is only desirable for a man to have one or two years' training. My contention is that we had better be careful in entering into reciprocal relations with such states.

Dr. HENRY McMANUS. If I may say a few words in defense of the motion, and for the benefit of those who were not here yesterday to hear the address and

the discussion on the same: this is simply a suggestion from our president, a man of reputation and ability, and it has been referred to these three distinguished elderly gentlemen, and the motion is that they be retained as a committee to carry out these views expressed by them so far

as it concerns this society. So far as the laws in other states are concerned, that has nothing to do with the motion.

The motion was then put and carried.

After election of the new members and induction of the new officers, motion to adjourn was made and carried.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Regular Monthly Meeting—October 1903.

THE First District Dental Society of the State of New York held a regular monthly meeting Tuesday evening, October 13, 1903, at the Academy of Medicine, No. 17 West Forty-third street; the president, Dr. Henry D. Hatch, in the chair.

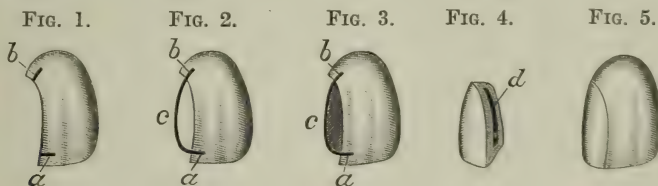
Dr. R. M. SANGER, of Orange, N. J., gave a talk on the use of diatoric teeth in bridge work.

Dr. L. M. HOMBURGER, New York city, then read the paper which follows:

A METHOD OF RESTORING INCISAL CORNERS WITH PORCELAIN.

The method I have adopted in restoring the corner of an incisor tooth with a

cisal edge (Fig. 1, *a*) large enough to accommodate an iridio-platinum wire, No. 24 standard gage. I cement that wire into place (Fig. 2, *c*), and bring the cement up under the wire, filling the space between the wire and the tooth fully, at the same time avoiding any undercuts, so that the sides are absolutely parallel. When the cement is thoroughly set I take a piece of platinum 1/1000 of an inch or gold No. 30 foil, depending upon whether high-fusing or low-fusing body is to be used. I burnish this into the cavity, bringing it over the cement and wire; the finished matrix then has a small teat in the center, instead of a depression as is usually the case for ordinary cavities; in other words,



porcelain inlay will withstand an enormous amount of stress, and, if done neatly, will remain longer than any other method I have ever seen.

We will call Fig. 1 a central incisor, from which a corner has been broken. After thoroughly preparing the cavity I take a small bur and drill a hole at the cervical end (Fig. 1, *b*), and at the in-

there is a depression the other way, which fits over the cement and the wire (Fig. 3, *c*). I then build up the porcelain inlay filling in the usual way upon this matrix, and after it is thoroughly built up and I have tried it in, I peel off the platinum, and I have then an inlay which of course has a depression in the center like *d*, Fig. 4.

I then take an old inverted-cone bur, put it in the engine, and revolve it on a carborundum stone in order to remove the blades and get a blank; this I also keep for future cases. I then fill the depression in the inlay with some carborine, which is for sale at the supply houses—it is a mixture of ground carborundum and glycerin. I now undercut the depression in the inlay by means of my inverted-cone blank revolving in the carborine.

The inlay is now imbedded face down in wax and the glaze etched off the back with hydrofluoric acid. The next procedure is to remove the cement from under the platinum-iridium wire, being careful to leave enough cement at the points *a* and *b* to hold the wire firmly in place. The tooth then presents itself with a loop of wire in the center. The tooth and the inlay are both thoroughly dried, and the inlay is cemented to place with oxyphosphate cement. (Fig. 5.) You will see that this must hold with a great amount of tenacity. The cement is forced into a space which has a marked undercut, it is also forced around the wire loop, which holds as your hand does around a jug-handle; besides, the cement adheres to both the dentin and to the etched surface of the porcelain, and it must needs be very strong.

Whenever you bake platinum or iridio-platinum in the porcelain you weaken it considerably, whereas if you have the cement inside, you strengthen the porcelain, because the cement will hold it at all points and prevent it from fracturing. For this reason this form of inlay has marked advantages over any with pins and loops baked in the porcelain. They have proved very satisfactory in my practice.

Dr. W. D. TRACY. I would like to ask Dr. Homburger if the area near the incisal edge would not be weakened after a hole had been drilled in the tooth sufficiently large to accommodate the wire. In my experience the enamel chips away at this point (point *a*), or the porcelain itself is fractured. We cannot deny the fact that the structure of the tooth is

weakened there, and that a shock at the proper angle would reduce it to a powder.

Dr. HOMBURGER. On my diagram I marked the point *a* too far down. I put it as far away from the incisal edge as possible without endangering the life of the pulp and I always drill this hole absolutely parallel to the cutting edge of the tooth. I never use wire larger than No. 24 standard American gage. The larger the hole, the more you weaken the tooth.

Dr. TRACY. I think the loop scheme is very ingenious, but I have always felt that in thin, narrow teeth which taper down to a knife edge at the incisal portion, it would be a very treacherous arrangement to have a hole between the internal and external enamel plates, and that the tooth would be weakened. I hope the doctor will have no failures there, but I prophesy that he will if he uses the method as illustrated on the board.

Dr. F. L. FOSSUME. I wonder how such teeth hold gold so well, considering that the tooth has to be cut out a great deal more than for a small pin. If they are to be restored by a filling, I believe porcelain will support the edge better than anything else on account of the cement binding it and the tooth together.

Dr. HOMBURGER. A porcelain tip inserted in that way is stronger than a gold filling, because the malleting would be apt to fracture or weaken the tooth. You have not only the strength of the oxyphosphate filling in the middle, but also the oxyphosphate around the enamel, which sustains it. In a gold filling the gold is condensed into the retaining pits, whereas by this method the wire is cemented into them, which instead of weakening the tooth strengthens it.

Dr. W. C. DEANE. Might I ask Dr. Homburger where he got that idea.

Dr. HOMBURGER. When I was teaching porcelain inlay filling at the New York College of Dentistry, Dr. Waterbury came down with an inlay for me to make for him. He had a matrix built somewhat on that plan, but he did not know how to fasten the inlay in. I made no claim for originality for the method of making the inlay, but I do for the

method of cutting the undercut in the inlay. Dr. Waterbury brought down the matrix made somewhat on that plan. I baked it for him with the color he desired. I suggested this plan of undercutting the inlay to him, and he adopted it. Since then, I have also used it right along. Up to the present time, I have never had one of these inlays come out or noticed any powdering away of the enamel at the point *a*. They have been in use now in my practice for a trifle over two and one-half years. As this loop method is only necessary in extreme cases where it is almost if not entirely impossible to insert a permanent gold filling, I think I am willing to take my chances of having the enamel fracture—which I do not think it will, provided the cavity be prepared with care—in preference to putting in a cement filling, or inserting a gold filling, which is apt to come out at any time, perhaps even while it is being finished off.

Dr. W. C. DEANE. Prior to teaching inlay work at the college, I gave a clinic and showed that work, and I discarded it because I found it would fracture there, as has been stated.

Dr. A. L. SWIFT. I have seen this method used successfully. I think there is room for a great deal of judgment in the angle at which the hole is drilled.

The size of the wire being very small, if it be very carefully done I do not see why it should fail at that point. In my experience it has not failed.

Dr. TRACY. While you are talking about this frail corner here, I am going to tell you what Dr. Ottolengui told me, and if he were here he would be glad to tell you himself, I am sure. That is, his method to obviate the chipping of the porcelain itself at that point. I am sure all of you who do porcelain work have at some time had the porcelain corners chip at that point. Dr. Ottolengui told me he had found that it strengthened his porcelain to make a bevel edge. Beveled edges in porcelain work have been tabooed; but he bevels the labial enamel wall inwardly. Instead of having a perfectly straight edge there for contact with the porcelain corner, he has the bevel come inwardly. Instead of having the porcelain right straight against that edge, he has it go in under the enamel; so when the strain comes there the outer plate will support the strain. I have carried out the idea in two or three instances, and while the corners so adjusted have not been in many months, I feel that they are less liable to fracture and shall watch them with much interest.

Adjournment.

B. C. NASH, *Secretary*.

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Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, APRIL 1904

EDITORIAL DEPARTMENT.

THE RECIPROCITY CLAUSE AGAIN.

WE publish elsewhere in this issue a criticism on the editorial comments made in March Cosmos upon the reciprocity clause recently introduced into the dental law of the District of Columbia. A careful consideration and analysis of Dr. Bryant's criticism have failed to convince us that his exceptions are well taken.

He claims that the law is national in its scope, "from the fact that it allows any dentist of any state or territory who can comply with its provisions to practice in the District of Columbia." Quite true; but that is not national legislation at all, and does not present any features of national application which are not common to all state dental laws now on the statute-books. Either the District of Columbia possesses a standard of qualification for license to practice or it does not; and if it does possess a standard of qualification, it will maintain that standard or it will not. There is nothing in the act defining a standard, so that it is purely a matter of discretion with the Board of Examiners to fix the standard of qualification to suit themselves. Reduced to plain terms, the law provides that the examiners shall satisfy themselves of the fitness of candidates to practice within the territorial limits of the District of Columbia. There is no provision making it necessary for them to satisfy anyone else who may be a party in interest, or to satisfy the public and the dental profession, who are after all the real parties in interest in all of these cases.

With no specifications as to standard defined in the law, no provision for a public record of its acts, and conferring upon the board unlimited authority to satisfy itself and nobody else, the act is one under which uniformity of standard is practically impossible, and there is no guarantee that with the changing personnel of the board the standard may not be subject to changes toward the extremes of insufficiency on the one hand or of impracticability on the other.

For these reasons discretionary power in the matter of standards is objectionable, as it leads to abuses and injustice, and should be eliminated from our dental statutes as far as possible. Acts should be specific and clear, and set forth the standard of qualification in detail—which the law of the District of Columbia does not do, and in our opinion it is therefore defective.

Into this weak and defective framework has been engrafted a so-called reciprocity clause. Now, the essence of reciprocity is that it shall be reciprocal; if it isn't that, it is not reciprocity. It is very clear that the recent amendment will permit the District of Columbia board to accept at their discretion properly authenticated and certificated applicants from other states and territories—yea, from any or all of them, as Dr. Bryant very expressly states. But that is not reciprocity which works in only one direction. To accomplish the *recus* as well as the *procus*, other states and territories must agree to accept licensees of the District of Columbia on equal terms, and it was appreciation of that important practical factor which led us to state in our previous issue that the so-called reciprocity clause in the District dental law was not national in its scope, because it does not and cannot have any compelling power to cause other states and territories to do by the District of Columbia as the District would do by them. But, supposing the same clause to be embodied in other state and territorial dental laws, would New York, New Jersey, Pennsylvania, Massachusetts, and the whole group of New England states and many others, interchange with the District of Columbia while the board of the District is empowered by law to satisfy only itself as to the qualifications of those whom it licenses to practice dentistry within its borders? We are inclined to doubt it, for no amount of juggling with the proposition will cover up the fundamental fact that all reciprocity must be based upon uniformity of qualification or it is not reciprocity either in theory or in practice.

The reciprocity clause is a step in the right direction, but it is only a step. It is permissive, but its possibilities can only be practically realized on the basis of a common standard of qualification. Our opinion is that until the District of Columbia embodies its reciprocity clause in an act defining the standard and making the examinations matters of detailed public record, the clause if operative at all will operate in the direction of admitting practitioners from other states on certificate to

practice in the District without according licensees of the District board equal opportunity to practice elsewhere in the Union on the same conditions.

Dr. Bryant thinks that "the dental laws so far promulgated seem to breed quacks and incompetents," and is inclined to regard the amended law of the District of Columbia as an exception—a sort of panacea for the difficulty of which he complains, and which therefore ought to be encouraged. But we would again remind him that even that beneficent possibility is still a factor of the discretionary power of the board; and if perchance a board has been found in the District of Columbia or anywhere else that actually can, in the judicious exercise of its discretionary power, positively exclude quacks and incompetents, we heartily agree with him that such a board should be encouraged, and more—its members should be made secure by a life tenure and ample compensation.

We regard quackery as an ethical disease or defect. It is true the term is often taken to include incompetency; but as Dr. Bryant uses both terms we take it that he makes the same distinction that we do—applying the term quack to the individual who resorts to questionable methods of advertising his abilities and professional work. Thus limited he is not necessarily an incompetent; indeed, some of the most blatant quacks are possessed of a high degree of skill and are by reason of that fact the most dangerous and obnoxious of their class.

For this type of disorder which irritates the professional body, legislation is not the most hopeful kind of treatment, simply because the disorder does not fall within the class of misdemeanors or criminal acts to which legislation under a republican form of government is applicable. It is an ethical or moral disorder, which if ever cured is curable through regenerative processes which tend to convince the wrong-doer of the error of his ways, cause him to repent thereof, and reform. The quack is beyond the reach of state boards of dental examiners, and as he is too old to send to Sunday-school he must be left to the tender mercies of the charitable and philanthropic among his ethical professional brethren for reformation by moral suasion and the suggestive powers of a good example.

The incompetent referred to by Dr. Bryant is undoubtedly the legitimate object of the earnest solicitude of the state boards, and against him the whole battery of state laws is directed with menacing power to exclude or reform him. Just how they "breed" him instead of excluding him we are at a loss to understand, or how the introduction of a reciprocity clause is to relieve the public of the effects of his incompetency is not by any means clear. If it were true, however—which we strongly doubt—that dental laws are breeders of quacks and incompetents, we should be inclined to inquire into the competency of those who are charged with their execution, especially in those cases where the boards were clothed with wide discretionary power.

Dr. Bryant accords the editor of this journal the honor of having suggested the movement which resulted in the reciprocity clause. In this he is in error; the reciprocity clause had been formulated by its author, Dr. Stockton, and discussed at the New Jersey meeting, before the writer's paper on reciprocity was read. Besides which, this journal has on several other occasions endeavored to promote the reciprocal recognition of dental licensees among the several states, but we have consistently adhered to the fundamental proposition that uniformity of standard of qualification is the only basis upon which reciprocal recognition is possible.

The medical profession has already accomplished practical reciprocity to a large extent solely on the basis of equivalent standards by the group system. It can be done as well and is already done in dentistry, not at discretion, but upon the basis of equal qualification.

Dr. Bryant believes that "it takes about five years to make a qualified practitioner out of the dental student taken from the college door." He does not specify which door or even which college. But this thinly veiled, morgantic compliment to the institutions engaged in the work of qualifying men for the practice of dentistry suggests an unfamiliarity with the subject. We know that incompetents somehow get through the colleges, but we also know that they get through the state boards; notwithstanding which we still believe that both boards and colleges are doing a splendid work which has raised the general average of intelligence and achievement of the dental profession several per cent. above its attainment before systematic education and dental legislation were established.

Our colleagues of Australia are just now facing the problem of national legislation in its bearing upon the vested rights of its federated states, as is shown by the editorial in the January issue of the *Australian Journal of Dentistry* which we publish in full at page 322. We are glad to see that the editor evinces a grasp of the essentials of successful reciprocity which we trust may assist our brethren of the antipodes to avoid some of the difficulties growing out of heterogeneous laws and irregular state standards from which the dental profession in the states of our Union are endeavoring to free themselves.

THE CLINICS AT THE ST. LOUIS CONGRESS.

Two half-days have been set apart by the Committee of Organization to be devoted exclusively to clinical demonstrations at the Fourth International Dental Congress in St. Louis.

Probably no feature of the Congress program will arouse more general interest than the clinical demonstrations, which will embrace the

latest modes of procedure in dental technique and practical operative dentistry by the best operators from all parts of the world. The space assigned to the clinical demonstrations in the Coliseum building, where the Congress will be held, is an ideal one for the purpose. One hundred operating chairs will be placed in a gallery magnificently lighted and so arranged that everyone may without difficulty observe any of the operations or demonstrations he may desire to witness. Already the number of demonstrations provided for is not only large and interesting but is cosmopolitan in scope.

The committee in charge of the clinical demonstrations is rapidly completing its work so that every detail having regard to the comfort of both operators and observers will be duly attended to when the Congress convenes.

Those who desire to give clinics or demonstrations in operative dentistry should make early application to Dr. J. P. Gray, chairman of the Committee on Clinics, 212 North Spruce street, Nashville, Tenn., in order that space may be reserved and the necessary facilities provided.

THE GOLDEN ANNIVERSARY BANQUET.

As had been previously planned, the banquet in celebration of the fiftieth anniversary of graduation of the class of 1854 of the old Philadelphia College of Dental Surgery was held at the Bellevue Hotel, Philadelphia, February 27th. The guests of honor were the surviving members of the class—viz, Drs. James Truman, Louis Jack, C. Newlin Peirce, W. Storer How, and Eri W. Haines. The guests numbered over one hundred, representing eleven different states. Letters of congratulation were received from practitioners in various parts of the United States and in Europe, including a congratulatory cablegram from Hong-Kong, China.

Dr. Edwin T. Darby, of Philadelphia, presided as toastmaster, and in his felicitous manner introduced each speaker. Dr. Wilbur F. Litch, dean of the Pennsylvania College of Dental Surgery—the immediate successor of the old Philadelphia College of Dental Surgery—delivered the opening address of welcome, and dealt at some length with the historical features of the occasion in a vivid and eloquent manner. The address of welcome was responded to by Professor James Truman on behalf of the members of the class. Dr. Truman presented an interesting picture of the professional development of dentistry which had taken place in the half-century that had elapsed since the graduation of the class which was being commemorated. Following Dr. Truman, the other members of the class—Drs. Peirce, Jack, How, and Haines—made interesting addresses

in response to the collective toast "Our College Days." The other speakers were Dr. B. Holly Smith, of Baltimore, who responded to the toast "The Mother of Colleges"; Dr. L. D. Shepard, of Boston, on "The Veterans of New England"; Dr. S. G. Perry, of New York, who spoke on "The Pioneers of Dentistry in New York"; and Dr. H. A. Smith, of Cincinnati, who responded to the toast "The Ohio College of Dental Surgery."

The occasion was a notable one from the circumstances which called it forth. So far as we are aware, never before in the history of dentistry has a semi-centennial anniversary of the graduation of so large a group of men been celebrated. The men themselves were a notable group. Five survivors out of the nineteen original graduates evidences a remarkably high percentage of a half-century persistence in professional activities. Not only were they in a certain sense dental pioneers blazing the highway over which a new profession was to travel, but each in his sphere has been a leader and contributor to the best results in dentistry. They have molded professional thought, directed its activities, and contributed to its intellectual and practical attainment. The audience was an interesting one; coming from all directions and various fields of activity, they were united for the time being by the good purpose and desire to testify their appreciation of their guests, and to do honor in a material way to the men to whom they had always credited a position of leadership.

The results of such an occasion cannot fail to be far-reaching. The example which it furnishes of cordial goodwill and of recognition of the labors and attainments of worthy collaborators is one which should be fostered and kept alive by frequent repetition as occasion may justify.



A CORRECTION.—"The first paragraph of the paper in the February Cosmos on "Zinc Oxychlorid" should have credited its origin to Dr. J. T. Metcalf, a dentist of New Haven, Conn., who made and used it first in 1853. He has an interesting article on it—giving his formulas, etc.—in the June COSMOS 1861 (vol. iii, p. 6), and refers to it again interestingly in "Reminiscences," in COSMOS for June 1903 (vol. xlv, p. 458). Those who possess files of the COSMOS will be interested in reading these articles. I am very glad to make this correction in the interest of historical accuracy and in justice to a veteran of nearly eighty-six.—C. W. STANTON."

BIBLIOGRAPHICAL.

"PRINCIPLES ET TECHNIQUE DE L'OBTURATION DES DENTS." ETC.

PRINCIPLES AND PRACTICE OF FILLING TEETH. By C. N. JOHNSON, Professor of Operative Dentistry, Chicago College of Dental Surgery. Translated from the second English edition by PAUL E. GIRES, M.D., D.D.S. Penn., and GEORGE ROBIN, M.D., D.D.S. Penn. Paris: Société Française de Fournitures Dentaires, 1903.

Recognizing the need for an exhaustive treatise on the art of filling teeth among French practitioners and students of dentistry, and appreciating the high teaching value of Dr. Johnson's work, the authors came to the conclusion that a French version of this work could be made to fill this long-felt want, especially among those desiring to familiarize themselves with the recognized and approved methods in vogue on this side of the Atlantic.

The translation of a scientific or technical work is an undertaking of greater magnitude than the casual observer would be perhaps inclined to consider it; for in order that the resulting version should stand as a fair representative of the original, not only is it imperative that the translator be thoroughly familiar with the intricacies and peculiarities of the languages concerned, but he must perforce have an accurate and detailed knowledge of the subject to be translated, as otherwise the result would be unsatisfactory, to say the least.

The extraordinary fitness and adaptability of Drs. Gires and Robin for the carrying out of this task may be plainly

gathered by the excellent results they have obtained, and the French translation may be said to constitute a complete and accurate presentation of Dr. Johnson's work. J. E.

ANESTHESIA AND ANESTHETICS, GENERAL AND LOCAL, FOR PRACTITIONERS AND STUDENTS OF MEDICINE AND DENTISTRY. By JOSEPH M. PATTON, M.D., Professor of Physical Diagnosis and General Anesthesia in the College of Dentistry in the University of Illinois, etc. Illustrated. Chicago: The Cleveland Press, 1903.

The author states in a prefatory paragraph that this book is not intended as a treatise on anesthesia, but as a complete and impartial *résumé* of our present knowledge on this important subject. The work embraces sixteen chapters. Chapter I is devoted to the "History of Anesthesia." The author begins his historical survey by referring to the writings of Homer, who, in the *Odyssey*, mentions that Helen of Troy made use of a narcotic (probably opium)—"a drug to lull all pain and anger, with forgetfulness of every sorrow." This may be said to constitute the earliest record of the efforts of mankind to subdue pain, as nothing on the subject is known prior to 850 B. C., the time at which it is supposed Homer lived. In the historical writings of the period from 850 B. C. up to the beginning of the Christian era, nothing whatever can be found that could throw any light on the ancients' methods of inducing insensibility to pain.

About the beginning of the Christian era, Dioscorides described the use of a decoction of the root of *Atropa mandragora*. In the second century Galen refers to the power of mandragora to paralyze sensation and motion. From the second to the thirteenth centuries little is known regarding the subject under consideration. In the thirteenth century the Tuscan physician, Hugo de Lucca, prepared an oil which, he claimed, "put patients to sleep on occasions of painful operations," but Hewitt, in his treatise on "Anesthetics and Their Administration," states that according to the testimony of Theodoric, his assistant, the preparation left much to be desired, for the patients had to be tied or held down by strong men.

The author reviews the history of anesthesia up to and including the discovery of the anesthetic properties of nitrous oxid by Horace Wells in 1844. He describes the circumstances which led Wells to experiment with nitrous oxid and to submit to the extraction of an aching tooth under its influence. He then refers to the experiments of Morton with sulfuric ether in 1846, and to those of Simpson with chloroform in 1847.

In Chapter II he discusses the "General Physiology of Anesthesia." Chapter III is on "The Selection of a General Anesthetic with Reference to the Comparative Dangers of the Agents Employed," Chapter IV on "The Selection of an Anesthetic with Reference to the Patient," and Chapter V on "The Selection of an Anesthetic with Reference to the Operation." Chapter VI embraces a consideration of the precautions to be observed before the administration of an anesthetic. Chapter VII is on "Posture during Anesthesia."

Chapter VIII is taken up with the discussion of nitrous oxid. Here the author refers to the opinion generally prevailing that nitrous oxid is not an anesthetic *per se*, but farther on mentions that the observations of Paul Bert have shown that anesthesia can be produced without asphyxial conditions by the conjoined use of nitrous oxid and oxygen. Dr. E. Andrews, in 1868, was the first to experiment on the combined administration of nitrous oxid and oxygen, and in his report, published in the *British Journal of Dental Science* in 1869, he states that he has obtained a more satisfactory form of anesthesia than with nitrous oxid alone. The fact that anesthesia has been induced with nitrous oxid with as high as twenty per cent. admixture of oxygen is, in the reviewer's opinion, a conclusive proof that in nitrous oxid we do not depend on its asphyxiating properties, but that it has inherent anesthetic properties.

Chapters IX and X are devoted to the discussion of ether and chloroform, respectively. In Chapter XI the author discusses the properties of ethyl bromid and ethyl chlorid, penthal, and other anesthetic agents occasionally used in dental practice. He also devotes a few pages to spinal anesthesia.

Chapter XII embraces a dissertation on "Anesthetic Mixtures."

Chapter XIII is on "Sequence of Anesthetics," and Chapter XIV on the precautions to be observed after the administration of an anesthetic.

Chapters XV and XVI are devoted to the study of "Local Anesthesia and Anesthetics in Dentistry." In the discussion of cocain and its salt the hydrochlorid we find very little regarding its physiological effects or its dosage for hypodermic purposes.

The subject of local anesthesia is one of such considerable importance to dentists that in the reviewer's opinion a work upon anesthesia should contain all the data necessary for the successful administration of local anesthetic agents. In the book before us the chapter on this subject is decidedly incomplete and is one from which an inexperienced student

would not gather any definite information.

The author deserves credit for the systematic way in which he has treated and correlated his subjects, and the book will doubtless render some service as an elementary work for students of medicine and dentistry.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Australian Journal of Dentistry*, Jan. 1904.]

RECIPROCITY IN DENTAL LICENSURE.

(EDITORIAL.)

With the advent of the Commonwealth of Australia and the development of the federal sentiment, which, according to the aspirations or wishes of the observer, have been more or less progressive during the currency of the first Commonwealth Parliament, many questions have come before the Dental Board relative to the eligibility of candidates for registration in the state of Victoria. These inquiries have been made more frequently since the aid of the various state legislatures has been sought to frame laws for the control and well-being of the dental profession. Thus many persons who became registered in the state wherein they were domiciled, and in the majority of instances without any educational or professional qualifications, but where they were supposed to have vested rights, were under the impression that being registered in their home or parent state, they have the right to register in any of the states of the commonwealth. If such were the case, it would be a source of great hardship to the students who have gone through the course laid down by the Dental Board, and gained the diploma of Licentiate of Dental Surgery, thus fulfilling the law in Victoria.

This aspect of affairs opens up the very large and somewhat difficult question of reciprocity between the governing bodies of the different states, with regard to an equitable and efficient standard of qualification for the practice of dentistry. In some quarters and in some centers of population, where facilities for dental education do not at present exist—if the information supplied to us is correct—

feelings of soreness, if not jealousy, have already manifested themselves with regard to what has already been accomplished in this direction in the older and more populous states. If this be the present condition of affairs, it is much to be regretted in the interests of progress. For these sentiments, if indulged in to any great extent, will, we venture to say, react in a measure disastrously in the endeavor to secure the broader and more liberal spirit of reciprocity among us.

To our way of thinking, the question narrows itself down to two elements of fundamental character, if the dental profession is to be safeguarded in the different states. First: There must be an equal law governing the whole in the different states. Secondly—and this seems to us the more important: The educational standard of the course of study (including the preliminary), the practical requirements, and the examination or examinations demanded of the students for the dental qualification must be absolutely equal as a whole and in detail. Without these essential principles underlying and governing the initiation of the scheme, the whole fabric of reciprocity will tumble about our ears like a house of cards.

The DENTAL COSMOS for December reports a paper which should be of interest to those of us in Australia who have thought about this subject, viz, "The Question of Interstate Reciprocity in Dental Licensure," read before the New Jersey State Dental Society in July last by E. C. Kirk, D.D.S., Sc.D., the able and popular editor of the COSMOS. We may be pardoned for thinking that in a country where so many dental colleges have been established for many years this question with its accompanying difficulties would have been settled

long ago. But on reading the paper and the subsequent discussion thereon, various reasons are suggested why reciprocity is not an established fact among a united people governed by a national central government. The difficulties in the way being the inheritance of the great struggle between the "Federal" and "Anti-Federal" parties at the inception of the United States, the same spirit which animated their forefathers exists in the dental profession at the present time, with regard to interference with their state rights. The "lion in the path" to be overcome is that the states having high standards of education refused to accept the licenses of states of lower standards, while the lower ones refused to accept licenses from the higher ones unless the recognition were reciprocal. Another difficulty is that the preliminary educational requirements are not of the same standard in the different states. The state examining boards have the final power for admission or rejection for license to practice in their individual states.

The question of reciprocity is thus actually in the air in both hemispheres, but it can only be accomplished by a process of leveling up—that is to say, by establishing, under the sanction of the law, a standard of dental education of equal value in every state in Australia. And that is for the future in the fulness of time to achieve; but though the discussion may be premature, it will assume practical importance when the Australian Commonwealth has become older, greater, and has solidified itself in the hearts and minds of the people—for the union, which is now confined to a few great national questions only, will as surely extend to social questions of no less importance, but which are lost sight of in the early transition days from disunited to united states.

[*Oesterreichische Zeitschrift für Stomatologie*, Vienna, December 1903.]

CONGENITAL TEETH. BY DR. JOSEF MARER.

The author states that eruption of teeth during intra-uterine life is a decidedly rare phenomenon, and proceeds to relate that he has examined cases which were reported to him as examples or prenatal eruption, but which upon close examination were found to be very imperfect dental specimens; indeed, they were cartilaginous lentil-shaped bodies rather than teeth, and could be readily removed with the fingers.

The eruption of true dental organs before birth is so extremely rare that no reference is made to it in some of the most authorita-

tive works on pediatrics. Hennoch, in his work, "Vorlesungen über Kinderkrankheiten," speaks of two varieties of congenital teeth. Those of the first variety are represented by one or two points projecting through the gum and attached to a layer of gingival mucous membrane, while those of the second variety are true teeth attached to their respective alveoli, and later on in life can be differentiated from the normally erupted organs in that the gum over these teeth is of a distinctly reddish hue and the enamel is yellowish and imperfect. Hennoch records four cases of congenital teeth. Monti, in his "Kinderheilkunde in Einzeldarstellungen," also speaks of *dentitio prematura*. From historical records we also know that King Richard III of England, Mirabeau, Cardinal Mazarin, and King Louis XIV of France were born with teeth. Dr. Marer then describes the case of an infant born with two well-developed incisors, which prevented it from suckling. The tongue was markedly inflamed, this being caused apparently by its being rubbed against the sharp edge of the teeth during the act of suckling. In view of these conditions the teeth were extracted and were found to be of the same size, form, and general appearance as deciduous teeth. The removal of the teeth was followed by appropriate antiseptic treatment, and the child, which was thereby enabled to take the necessary amount of nourishment, rapidly improved and gained in weight.

[*Journal des Praticiens*, Paris, October 1903.]

SYPHILITIC NECROSIS OF THE MANDIBLE. BY DR. CREUTZ.

The essayist reports the case of a woman aged twenty-three who complained of severe pain about the extremities and in the mandible. The pain was of such an excruciating nature that she had been unable to sleep for over one month. The mandible showed the absence of all the incisors, the canines, and the right first premolars. The bone was completely denuded posteriorly and anteriorly to the extent of one centimeter. The alveoli were filled with pus, the bone blackish in appearance, and the lower right second premolar and lower left first premolar were loose. The breath was very offensive. The upper teeth, as well as those remaining upon the mandible, were apparently in good condition. The body of the mandible had increased in size. The history of the patient facilitated the diagnosis, the phenomena described being doubtless the result of syphilitic intoxication. The specific treatment was helpful in subduing the intense pain.

[*Western Dental Journal*, February 1904.]

ESSENTIAL OILS. BY DR. J. R. SHANNON,
WEEPING WATER, NEB.

The essential oils possess many qualities which render them useful and desirable agents in dental practice. They are diffusible, do not coagulate albumin, and the most delicate canals may be dressed without any danger of clogging them. The author classifies the essential oils into three groups: First, those possessing irritating or stimulating antiseptic properties, and in this group he includes oils of cassia, cinnamon, and myrtle. Second, those possessing quieting, soothing, or sedative properties, as oil of cloves. Third, the neutral groups, embracing eucalyptol, cajuput, and Black's "1, 2, 3." When the antiseptic property alone is to be considered, oil of cassia is the most potent, but also one of the most irritating. In treating a chronic abscess where the cellular activity of the entire fistulous tract is dormant, and the use of milder antiseptics fails to accomplish the desired results, oil of cassia may be used in solution, or in full strength forced through the tract. The author has not overlooked the discoloring effect of the oils of cinnamon and cassia upon the teeth, and calls attention to this objectionable feature, stating that for this reason it would be hardly safe to advocate their use. Of course the importance of this objection is greatly reduced when these oils are used in the treatment of posterior teeth, where discoloration would be of less consequence.

Dr. Shannon recommends the oil of cassia in the treatment of any tissue where a good antiseptic and stimulant is indicated. The oil of myrtle, although belonging to the same class as oil of cassia, does not possess these qualities to the same degree.

Oil of cloves belongs to the group of sedative, non-irritating antiseptics, and is considered by the author as one of the most useful of the essential oils. It is non-irritating even when kept in contact with soft tissue for some time, and when applied to inflamed areas it exerts a quieting and soothing effect not obtained by any of the other oils. As an antiseptic it ranks with campho-phénique and creasote. The combination of these two qualities renders it a most desirable agent in treating teeth where the inflammation has progressed beyond the apex. It may be sealed in root-canals without any fear of objectionable after-effects.

Black's "1, 2, 3" is the most potent antiseptic combination of essential oils. Cajuput is slightly antiseptic, and being a solvent for

gutta-percha it is used to moisten the walls of the canal before introducing the filling material. Regarding the action of eucalyptol, the active principle of eucalyptus, the author states that while not a powerful antiseptic, it is yet potent enough to maintain an aseptic condition where it is desirable to defer the filling to some future time. Eucalyptol is a good solvent for gutta-percha.

[*Dental Summary*, March 1903.]

THE TREATMENT OF PYORRHEA ALVEOLARIS (SO CALLED) WITH THE X RAYS. BY WESTON A. PRICE, D.D.S.,
M.E., CLEVELAND, OHIO.

Dr. Weston A. Price reports the following interesting case:

Mr. H., aged about fifty, had been troubled a great deal for the preceding five or six years, during which time the upper right lateral had become loosened and was lost, the canine adjoining being very sore and somewhat loose, with a very profuse flow of pus. He said there had not been a time for years when he could not press a quantity of pus from the cavity—as much as a drop every time he pressed his finger over that tooth. The centrals were quite badly affected, as was also the right canine just below.

About ten to twenty minutes were spent in removing readily removable deposits and débris from all these teeth, and an opaque mask was put over the patient's face, care being taken at each sitting to cover the lower canine and to expose the upper canine root-area. The test was to try to expose the worst tooth to the X rays while protecting the rest and very particularly the lower canine.

The patient's business—and probably more than a little his lack of hope for any beneficial effect—made it very difficult to get sittings regularly, but a number of treatments were carefully made from one to two weeks apart. Whether incidentally or not, the pus rapidly disappeared from the upper canine under treatment, while there was no change for the better around the lower canine. The congested and bluish, angry gum, with its gaping pocket around the tooth being treated, progressively and quite rapidly changed to a pinkish white, and the thickening became reduced to about the proportions of a normal gingival margin. A very marked change in the condition was that the gaping pocket became constricted until the tissue hugged the root quite closely, insomuch that it took considerable pressure to pass a scaler between the tooth and gums into the pocket.

There was a very marked change in the

response of the tissues. Before the treatment the tooth was very tender to the brush, and the gums painful. It caused much pain to put an instrument into the sensitive pocket. After the series of treatments this sensitiveness disappeared; the patient in describing the change said that before treatment the tooth felt like a foreign substance and an irritant, and afterward it felt like his own tooth. The upper canine area had no treatment that the lower did not have *except the exposure to the X rays*. It is now seven months since the last treatment, and there is no recurrence of pus or any of the typical symptoms, while the lower canine still has its flow of pus on pressure, and also much tenderness, and has continually grown worse. The upper centrals were generally partially or wholly exposed during the treatments, and while the condition was not aggravated around them to start with, they too were very materially improved.

[*Archiv für Zahnheilkunde*, Berlin, February 1904.]

THE CONTACT POINT IN THE RESTORATION OF TEETH WITH APPROXIMO-OCCLUSAL FILLINGS. BY M. WAHLTZ, D.D.S., DRESDEN, GERMANY.

The importance of properly contouring fillings in order to establish correct contact between the teeth is fully appreciated by the essayist. He compares the contact point between teeth to that which would result from the close approximation of two marbles, stating that it occurs at a short distance rootwise from the occlusal surfaces of the teeth. The inter-approximal space is normally filled with healthy gum tissue, and is completely destroyed if the teeth should not come in contact at one single point. This would lead to the evolution of pathological processes affecting the pericementum, and cause eventually the loss of the affected tooth or teeth. Often, instead of there being a normal V-shaped space between the teeth, they are found in absolute contact, the gum being entirely pressed away from between them. In this condition the "automatic" cleansing process cannot take place, and with each closure of the jaws the food is pressed more firmly into the space, where most of it remains until removed by some mechanical means, such as a toothpick.

The loss of the contact point between teeth is often the source of great annoyance to patients through their inability to remove accumulated food, and if this phenomenon is not rapidly remedied it results eventually in

fresh decay and possibly in pyorrhea alveolaris. The restoration of the contact point is just as essential as the perfect adaptation of a filling to the cavity in order to close it hermetically, or as the proper adaptation of an artificial crown to the root-surface. The making of a perfect contact between teeth precludes the use of files, disks, and stones either before the introduction of the filling or during the finishing process. It is comparatively a small matter to restore the contact point with amalgam, a more difficult matter with gold, and a still more complicated one with porcelain.

Dr. G. V. Black (*Dental Summary*, February 1904) called attention to the disturbances following the insertion of fillings which do not restore the original contour of the teeth, stating that, in practice, cases are frequently seen in which the contact points have been lost through caries and the teeth have crowded together, closing up the normal approximal space until their necks have come close together.

The technique of cavity preparation and the methods of filling cavities have been modified from time to time concomitantly with the progressive evolution in the study of dental caries, until at the present time our efforts are directed to the full restoration of the original forms of teeth in order to avoid accumulation of food, and that fermentative process which plays such an important factor in the causation of dental caries.

[*Russian Medical Gazette*, Moscow, 1903.]

THE ACTION OF ADRENALIN. BY DR. ZELAVANETZ.

Dr. Zelavanetz has found that adrenalin is inconsistent in its action, and therefore careful precautions should be observed when it is employed hypodermically. In weak doses it stimulates in the organism the interchange of oxygen and carbon dioxide; in large doses it inhibits oxidation and reduces the temperature. It does not act upon the peripheral nerve-endings, but after producing a certain degree of excitement it paralyzes the pneumogastric centers.

[*Annales de l'Institut Chirurgical de Bruxelles*, December 15, 1903.]

LATE ERUPTION OF AN UPPER CANINE. BY DR. AUWERS.

The author made and inserted a full set of artificial teeth in the mouth of a patient aged forty-three. In the preparation of the mouth several teeth and roots were extracted. The plates were worn comfortably for about one

month, at which time a swelling appeared upon the palate at about one inch from the anterior portion of the alveolar ridge. The swelling was painful, and through the center of it could be seen the protruding end of a

body which examination with an explorer showed to be an impacted canine. A few days later the tooth was extracted under cocain anesthesia. The root was very long and curved.

PERISCOPE.

A Practical Hint.—When the rubber dam will not stay where you want it under the gum, use fine copper wire as a ligature and it will readily adapt itself just where you desire it to stay.—L. W. JORDAN, *Dental Summary*.

New Process for Zinc Oxid.—*The Chemist and Druggist* credits Sir William Ramsay with devising a process for making zinc oxid direct from ore or tailings by dissolving the zinc in the ores in sulfuric acid, precipitating with ammonia, and subjecting the resulting hydrate to intense heat in a muffled furnace.—*Amer. Journ. of Pharmacy*.

A Mummifying Paste.—

R—Dried alum,

Thymol,

Glycerol, āā 3j;

Zinc oxid, q.s. to make a stiff paste.

Misce.

Sig.—Apply to pulp-chamber and cover with gutta-percha.

—H. R. SOULEN, *Dental Brief*.

A Little Point to Remember when Inserting a Mechanical Separator.—Whenever the separating points go higher than they should, crowding uncomfortably on the soft tissues, the screws should be relaxed, the points held in the right position, while pieces of gutta-percha are warmed, and crowded under the bows. When these are hard (and the hardening may be hastened with the chip-blower) the upward movement of the points is prevented, and separation is proceeded with as usual.—GARRETT NEWKIRK, *Dominion Dental Journal*.

The Mechanical Separator during the Insertion of Gold Fillings.—In the insertion of gold fillings the application of the instrument should be gentle at first, then slightly increased from time to time as the filling progresses to the full extension of the contact point and final finish of the same. Then

the separator may be employed as a test. Removing the force, allowing the teeth to fall together, one may judge in a few moments, by using the floss silk, whether the contour is too full or just right. If the former, the screw is turned on again, and a little more is removed with thin, fine, oiled cuttlefish strips. The perfect point of contact cannot, as we know, always be determined at once. Days afterward, it may be, the discovery will be made by the patient or operator that the floss cannot be passed at all. The separator can be placed, without the dam, and the tape again passed as before said.

When it becomes reasonably evident that sufficient space cannot be had with the mechanical separator alone, and where faults of previous operations have to be remedied, where a closed approximal space needs to be restored, the Perry separator is valuable at the beginning. It is less painful to the patient to open sufficiently for wood, or gutta-percha, or cotton, than to bear the teasing, gnawing, tormenting piece of rubber band so often inserted for that purpose. And when cavities are opened up sufficiently for gutta-percha stoppings which are also to act as wedges, the separators are, with me, indispensable in a large proportion of cases.—GARRETT NEWKIRK, *Dominion Dental Journal*.

"Dont's" in Porcelain Inlays.—Don't grind an inlay after it is set, on any surface other than the grinding surface of molars and bicusps and the cutting edges of anterior teeth. All grinding that is necessary should be done before the matrix is removed, and then returned to the furnace and glazed. The glazed surface of porcelain is a protection to adjoining tooth-surfaces. Don't set an inlay without putting on the rubber dam wherever it is possible to do so. Always have pressure either by wedge or ligature, and leave thirty minutes before removing dam; cement setting under pressure gives the best results and prevents expansion making a noticeable joint.—W. T. REEVES, *Dominion Dental Journal*.

Massaging in Pyorrhea.—Massaging the gums often increases the capillary circulation, the lack of which is one of the principal causes of this disease. We often meet the disease advanced to the stage when the teeth have become loosened. I have found ligation, in the not too far advanced stage, satisfactory in lessening the danger of increasing the surrounding inflammation, but when the gums have loosened to such an extent as to entirely fail to support the teeth I use a number of bands, either of gold or of other suitable metal, made to tightly fit the necks of the teeth well up toward the biting edge. After placing these bands in position I take an impression, removing bands in same, soldering bands together in relative positions and then replacing, with the use of cement if found necessary; then proceed with treatment.—F. R. MAYER, *Internat. Dental Journal*.

The Scientific Attitude in Everyday Life.—Prof. Francis E. Lloyd of Teachers' College, Columbia University, in an address to the recent graduating class of Northwestern University, described the method of thought used by the scientist, and showed that this method is used by all of us in everyday life; that it is the method which we use as children. When used by the scientist it comes under careful scrutiny and control. We therefore see the meaning of Huxley's statement that the method of the scientist is refined common sense. All studies may be prosecuted by this method, since it is common to all. Any advantages which one study may offer beyond another must be due to its subject-matter. The strict application of the scientific method makes for ideals in life and character, since it enforces upon the mind standards of honesty which are of the highest, and are impersonal. Those who have had the advantage of scientific training should see clearly that they are under the obligation to carry the ideals thus gained into their everyday life.—*Amer. Journ. of Pharmacy*.

The Platinum Supply.—Platinum is a metal so important to dentistry, and so indispensable to the chemist and electrician, that the paucity of the supply as compared with present and prospective demands is a matter of world-wide interest. According to a report of Mr. Joseph Struthers to the Department of the Interior, about ninety per cent. of the world's output is obtained from Russia, the greater proportion of the remainder being furnished by Colombia, South America. In the United States platinum in small amounts has been found, chiefly as a secondary deposit of the gold placer deposits

of California. The domestic production, however, has never exceeded 1408 ounces, which was the output in 1901, while in 1902 the total amount secured was only 94 ounces. In Russia the platinum-bearing areas extend along the eastern and western watersheds of the Ural Mountains, where the metal occurs chiefly in the sands of rivers, the deposits varying in richness from a few milligrams to from ten to thirteen grams (150 to 175 grains) per ton. As a rule, the platinum grains are small, but a nugget is occasionally found.—*Dental Brief*.

Materials which have Displaced the Primacy of Gold for Filling Purposes.—

Gold for a long time held almost absolute sway because it was thought to be a noble metal, not to be acted upon by the secretions of the mouth, imperishable in its nature, and hence one which, judging solely from its own characteristics, would form an admirable filling. To replace tooth-substance by a material of such a high degree of stability as well as beauty naturally appeared to the observers of that time as the proper thing to do, and all efforts were directed toward doing that thing in the best possible way, as they are still so directed. Many years ago there was no material other than gold which possessed anything like its good qualities as a tooth-saving substance. Amalgams had not been made, gutta-percha was unknown, and our present cements undiscovered; so that we have at our command today a large list of tooth-saving materials to which we can have recourse, and which have very largely displaced the primacy of gold as a tooth-saving material. Gutta-percha undoubtedly has great tooth-saving properties—properties not equalled, I think, by any other material. Its chief disadvantage is that it has not the hardness necessary to resist abrasion, but on protected surfaces, leaving out all esthetic considerations, it certainly has better tooth-saving qualities than any other substance.—W. F. LITCH, *Dental Brief*.

Vulcanization at Low Temperature: Its Advantages.—

I think that the liability to disintegration or discoloration in pink rubber, black rubber, or red rubber may be somewhat obviated, and that any kind will make a more perfect plate, if vulcanized for a long time at a low temperature; and I have found that pink rubber, when treated in that way, gives greater strength, greater durability, and greater impenetrability. The practice of vulcanizing pink rubber or other rubber for the usual time of one hour at a temperature of 320° is not a proper one; no less time than an

hour and a half at from 308° to 310°, or, far better still, three hours at 290°, will give a much more satisfactory result. There is not a pink rubber upon the market but is increased in strength and durability, just as the red rubber is, by vulcanizing a long time at a lower temperature. Pink rubber will absolutely not change one iota in color, in ten, fifteen, or twenty years, if vulcanized three hours at a temperature of 280°, running it up to 290° at the end of the third hour. I say that because I have proved it in my experience. It will not disintegrate, and will not be penetrated by fluids of the mouth. So that you, who are wedded to the pink gums, if you treat your rubber in that way, will find that the color will be maintained, and the impenetrability will be just as good as that of the red rubber that you vulcanize now at 320° for one hour.—J. D. PATTERSON, *Western Dental Journal*.

Swaging Aluminum Made Easy.—A plaster impression of course; make no changes in it; fill as usual; upon removing the model build it up to requisite height one and one-half inches on a slab, sloping the sides so that it will drop readily from the mold; cover with thin shellac; with thin base-plate wax place a "relief," covering the hard palate from near top of ridge to within one-quarter inch of rear of plate, and extend plate to nearly on a line with base of tuberosities; shellac again. No scraping, no vacuum cavities; no grooves ever needed. For die use only Babbitt metal, as the only metal having all the requisite qualities for a dental die. For counter-die: Lead 5 parts, tin 1 part, and do not pour until it begins to thicken, and one die and counter is sufficient. Use 20-gage aluminum; never anneal, as it is easily swaged without, and the plate is none too stiff in wear. As the metal is so soft it easily tears over the margin of the ridge; to prevent this, scrape away the portion of the counter-die wherever it enters an undercut, in front, or at the tuberosities. After swaging, the plate can readily be driven into these depressions. Never use the mallet over the palate, as it will batter, but swage with a wad of wet paper over the palate. The plate should be worn as high as possible, but can and should be higher over the canine eminence than elsewhere, and the gum full there. Of course, when this is properly done, there is no room for turning the edge, which is entirely unnecessary, as the rubber makes a good finish for the margin. The loop-punch is the only reliable method of attaching the rubber; one row near the margin, four loops each side, and a row of eight on top of the

ridge. By the above method I will guarantee a quick and successful adaptation to the jaw.—L. P. HASKELL, *Dental Summary*.

Buccal Expressions of Constitutional States.—There was a tempest in diagnosis over the deathbeds of Mary II of England and Louis XV, who both died of smallpox. The tempest in the case of Mary was due to a fight between society physicians and medical politicians, and was settled by the dictum of Radcliffe, who had rare skill in diagnosis. The medical contest over Louis XV (1774) was essentially one between the partisans of the courtesan Dubarry, and those of the Dauphin, afterward Louis XVI. The hesitation was pardonable, since forty-six years previously (1728) Louis XV had had an attack of smallpox. The contest was more over the gravity of the disease than its type. It is a singular illustration of the value of local conditions in diagnosis that Voltaire says that just ere the more serious symptoms of variola made their onset in 1774, "Bourdet, the king's dentist, examining the royal mouth, had recognized by the appearance of the mouth the premonitory symptoms of a serious malady, and communicated his apprehensions to one of the ministers of state."

Bourdet, like reputable dentists of that time, was medically educated, and, so far as diagnosis then went, was trained in local aspects of constitutional disease. Before the days of the thermometer, stethoscope, and what are called instruments of precision, training in the local expression of constitutional states was of necessity more exact and minute than when these instruments became at the service of the physician.—E. S. TALBOT, *Dominion Dental Journal*.

How Radium is Obtained.—In spite of the fact that the marvels of radium have been so widely discussed and have created such a flurry of excitement not only in the scientific world but among the general public, probably very few people are acquainted with the method by which it is secured in the minute quantities that are as yet available. That the element is obtained from pitchblende is generally known, but some details of the exact process will be of interest. According to the *Lancet*, operations for the extraction are commenced by crushing the pitchblende, and then roasting the powder with sodium carbonate. After washing, the residue is treated with dilute sulfuric acid; then the sulfates are converted into carbonates by boiling with strong sodium carbonate. The residue contains radium sulfate, which is an exceedingly insoluble salt. The soluble sul-

fates are washed out, and the residue or insoluble portion is easily acted upon by hydrochloric acid, which takes out, among other things, polonium and actinium. Radium sulfate remains unattacked, associated with some barium sulfate. The sulfates are then converted into carbonates by treatment with a boiling solution of sodium carbonate. The carbonates of barium and radium are next dissolved in hydrochloric acid and precipitated again as sulfates by means of sulfuric acid. The sulfates are further purified and ultimately converted into chlorids, until about fifteen pounds of barium and radium chlorid are obtained by acting upon one ton of crushed pitchblende. Only a small fraction of this mixed chlorid is pure radium chlorid, which is finally separated from barium chlorid by crystallization, the crystal from the most radio-active of the solutions being selected. In this way the crystals ultimately obtained are relatively pure radium chlorid of a very high degree of radio-activity.—*Stomatologist*.

A Useful Antiseptic Combination.—Take two fluidounces of pure liquid carbolic acid and equal parts camphor, menthol, and thymol. Place the latter substances in a colored three-ounce bottle, pour the acid over, and shake. It immediately becomes milky; complete solution takes two or three days; more menthol, camphor, and thymol should be added till acid is saturated. Decant clear solution and it is ready for use. It should be kept in a brown or dark blue bottle with a well-fitting glass stopper. Indications: A pulpless tooth with chronic abscess. Gain access to canal, syringe out with H_2O_2 three per cent.; treat with sodium dioxid, dry the canal and flood it with the antiseptic, forcing it into the abscess sac and out through the sinus, if one be present. The apex is now sealed, and subsequent treatment is given through the sinus, one drop of the agent being placed in the sac by means of a hypodermic syringe. Sometimes one sitting, but generally two or three sittings are necessary to bring about a cure. It is not good treatment to hurry with a chronic abscess.

This combination is useful when used in full strength for wiping out cavities previous to filling. For pulpitis it is valuable. A small pledget of cotton wool moistened with it, placed over the pulp and covered with a light dressing, inserted without pressure, will give immediate relief. Four mimims in half a tumbler of warm water makes a good mouth-wash, leaving behind an agreeable sensation of cleanliness. It is, however, not recommended as a mouth-wash for constant use, but mainly after extractions or operations in the mouth. It is an efficient agent

for the relief of pain after the extraction of teeth with pericementitis. I regard it as next in value to hydrogen dioxid as an all-around antiseptic and germicide. It is very simple to make. The addition of five grains of saccharin to every ounce makes it more acceptable to patients as a mouth-wash.—*BERNARD BENNETTE, Dental Record*.

Immediate Removal of Live Pulp by Painless Method.—Apply the rubber dam if possible, and dry the cavity. If pulp is not exposed but is covered with a layer of softened dentin, apply first a drop of adrenalin, then one drop of a forty per cent. solution of formaldehyd. If quite a distance from the pulp, use slight but continued pressure with a rubber plug for a few seconds; the cavity can now be excavated to complete or near exposure painlessly. Then apply to the cavity one drop of adrenalin; best applied by taking up some in the operating pliers by capillary attraction; then lay in the cavity a few crystals of cocain or a small one-sixth grain soluble tablet. After this operation is complete, apply one drop as above, of a forty per cent. solution of formaldehyd. Apply pressure with a rubber plug, at first very lightly though steadily, but with not enough pressure to cause the patient any pain. Gradually increase the pressure until the end of forty or sixty seconds. You are kneading the rubber into the cavity with amalgam burnishers with all permissible force, none of which should cause the patient any pain. Now remove the covering to the pulp-chamber, and pass the broach slowly toward the apex. If there be a tendency to much hemorrhage, or patient should feel in the slightest degree any movements of the broach, repeat the method, being sure to omit the formaldehyd. After this one can remove the pulp of any tooth without the patient feeling the operation, and in cases where the tooth is slightly sore to percussion, as in the advanced stages of pulpitis, the soreness will have disappeared—as, many times, I find, that the peridental membrane has lost its tactile sense. In cases of large apical foramen, and where you are bothered with hemorrhage again, apply the adrenalin only, with pressure for fifteen seconds, and not another drop of blood will be discharged. Those who prefer can proceed with root-filling; I prefer to dress the root with a non-irritant dressing (mine is campho-phénique) for twenty-four hours, and then fill. It is essential that the remedies be used in the order given, or only partial success will result, as the adrenalin must be applied first to contract the pulp, thus drawing it away from the exposure, to prevent pain.—*CLYDE DAVIS, Dental Summary*.

HINTS, QUERIES, AND COMMENTS.

ETHER AS AN OBTUNDENT FOR SENSITIVE DENTIN.

WHAT dentist is there who is not interested in the subject of sensitive dentin? In my opinion it is the foundation of the dread that possesses all people when approaching the dental chair. Eliminate the pain of excavating and drilling preparatory to the insertion of a filling, and the fear of a dental ordeal is reduced to a minimum. Much space has been given to this subject in our journals lately.

The method I am using, while not involving any new principles, is new, as far as I know, in its mechanical application.

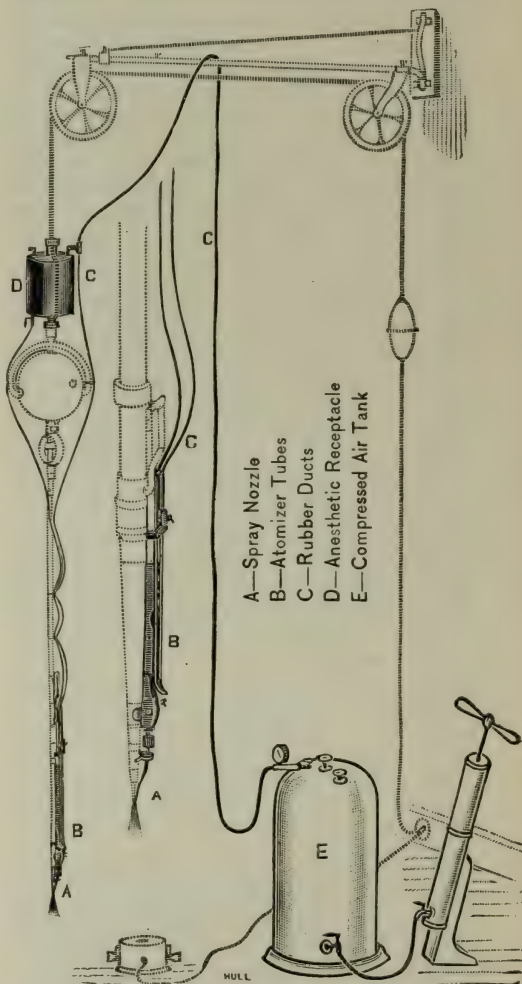
To have an assistant place ether, drop by drop, upon a tooth, and evaporate it by a chip-blower while the drilling is being done, is a method that is familiar to nearly all dentists. That this method does not prove satisfactory is owing to the inability to obtain a sufficiently reduced temperature, and to keep it low.

During 1902, Dr. C. R. Basford of San Francisco, Cal., obtained a patent upon his device which consists of a tank for compressed air, a receptacle for the ether, rubber tubes conducting the compressed air and ether to an atomizer tube, from which a continuous fine spray is emitted through a tiny nozzle in juxtaposition to the drill point.

After adjusting the dam, I place upon the offending tooth a piece of cotton, and spray directly upon this. There is at once a sensation of coldness, but it soon passes away as the spraying continues; upon which the cotton is removed and the spray is directed into the cavity. In from three to ten minutes there will be perfect immunity to all coldness in the tooth. This point reached, then the drilling can be begun—continuing the spraying—and there will be no sensation of pain whatever.

With twenty pounds air pressure there is sufficient force to drive the ether into the

tubuli of the dentin, chilling the contents and rendering the cutting of the dentinal fibers painless. The temperature of the tooth is re-



duced to about 46° F., but resumes the normal within a few moments.

This method I have used daily for over a year. It has never failed me. The air and ether valves are adjusted to an exact nicety.

An excess of either will not give the result. The rapid evaporation of the ether allows the instant inspection of the cavity at all times. A drop or two of perfume placed in the ether receptacle disguises the ether odor almost completely.

The dam is carried above the nose, and a cotton roll placed upon the upper lip holds the dam away sufficiently to allow the patient to breathe.

There are no after-effects, and not any immediate ones, that I know of, during one year's daily use by myself; and Dr. Basford had used it continuously for two years previously.

The question often asked me by dentists, as to the subsequent death of the pulp, has yet to be determined. During three years no such result has occurred, to my knowledge.

When necessary to devitalize, this arrangement is all one could desire for the anterior teeth, as the nerve can be taken out by it very nicely. In the bicuspid and molars an opening can be made and the pulp freely exposed without pain, but I have not been able to remove pulp in these teeth when using the spray. To secure such an opening for either

arsenic or cocain it is only necessary to keep on drilling.

The results obtained by the "Basford Obtunder" are so excellent, so sure, and so without loss of time, that it should recommend itself to others as it has done to those of us out here on the Pacific Coast who have seen it used and tried it. In cavity preparation for porcelain, where "extension for retention" is a factor, it is a pleasure to me to be able to drill and prepare my cavity exactly as I wish, without being annoyed at all by the knowledge that my patient is being hurt.

The fact is simply this: *There is no pain.* Therefore I remove all discolored dentin, avoiding the problem of sterilizing unexcavated dentin left charged with bacteria, and I extend the cavity margins both buccally and lingually beyond the area of liability.

This spray is the delight of every person upon whom I have used it; and speaking as to myself personally, it gives me such comfort and satisfaction that I hope other dentists may take it up and use it with the same benefits.

CRITTENDEN VAN WYCK.

OBITUARY.

DR. OTIS AVERY.

DIED, Monday, February 22d, at his home in Honesdale, Pa., Dr. OTIS AVERY, in the ninety-sixth year of his age.

Dr. Avery was born in Bridgewater, Oneida county, N. Y., August 19, 1808. The family of which he was a member is of English origin, and the old manor-house of the Avery family is still owned by its representatives in Devonshire. Some of the family emigrated to this country among the earliest Puritans. John Avery, his paternal grandfather, was born at Broughton, Conn., and served for a time in the French and Indian war, all through the war of independence, and after the close of that struggle engaged in the occupation of a teacher, dying when nearly one hundred years of age. Dr. Avery's father, John Avery, was a silversmith and

watchmaker by trade, following that occupation in New London, Conn. Thence he emigrated to Oneida county, N. Y., where he was identified with the earliest settlement of that section of the country. He married a daughter of William Humphrey, who had also served in the revolutionary war as captain.

Dr. Avery enjoyed the benefits of a good English education, and when of sufficient age was apprenticed to the trade of a watchmaker in his father's shop. At the age of fifteen he left the paternal roof and worked as a journeyman at his trade in Waterville, N. Y. At the age of eighteen he removed to Cohecton, N. Y., where he served as clerk in the store of his brother John for a time, and then opened a watch-repairing establishment of his own, removing about 1821 to Bethany,

Wayne county, Pa., where he also established a shop. From there he went to New Berlin, N. Y., where he located and pursued his usual vocation. At this time the desire seized him to adopt the profession of dentistry as his life-work, and for two years he received theoretical and practical instruction in the office of Dr. D. C. Ambler, a prominent dentist, at 10 Barclay street, New York city. On December 6, 1833, he received a certificate of qualification from Dr. Ambler—the only mode of graduation in those days—and at once entered upon the practice of his profession. The certificate is as follows:

"NEW YORK, December 6, 1833. This is to certify that Mr. Otis Avery has received instructions of me in the art of dentistry and has become fully acquainted with each one of its branches; this together with a favorable turn of mind for the operative part of it, I can with confidence and pleasure recommend to my friends and the public as highly skilful in his profession and in every respect deserving the most liberal patronage.—D. C. AMBLER, Surgeon-Dentist, 10 Barclay street, New York."

For the first three or four years Dr. Avery pursued his calling over the large extent of country lying between Utica and Honesdale, there being but one other dentist in all that section, meeting his patients by appointment at various places. In 1839 he located at Bethany, Wayne county, where he practiced in the summer-time, but through the solicitations of his old preceptor, Dr. Ambler, he practiced in the winter season at Columbia, S. C. This plan he followed for ten years. Subsequently he opened an office in New York city, but his Wayne county practice demanding so much of his time he gave up the New York office, and in 1850 established an office in Honesdale, where he continued to practice almost until the time of his decease.

Dr. Avery was one of those pioneers whose training in the art of dentistry was obtained before there was any organized system of dental college education. That he was highly skilled as a practitioner is attested by the large and successful practice which he enjoyed, but his skill was of a peculiarly high order, and in certain respects beyond that of the average practitioner of later generations. The writer has had ocular evidence of his high-order of handicraft evinced in

the beautifully made set of operative instruments the products of his own manual skill—instruments which certainly few, if any, of the practitioners of today could reproduce. Not only are the precision of their execution and the beauty of their finish remarkable, but also the exquisite temper which they possess in varying degrees, adapted to the class of work for which they were intended to be used.

Besides pursuing his profession closely, Dr. Avery was also largely interested in mechanical invention and research. About 1850 he invented a sewing machine for which he obtained a patent, which was sold to a company. As the agent for this company he afterward visited Europe and sold patent rights to parties in London and to the Emperor Louis Napoleon in behalf of the French government.

Aside from his professional work, Dr. Avery was a man of affairs and a prominent and valued citizen in the community in which he lived. In 1855 he was elected on the independent ticket to represent his county in the state legislature, and served acceptably for one term. He was appointed by Governor Gary, November 20, 1871, associate judge of the county to fill a vacancy caused by the declination of his predecessor, who had been elected on the republican ticket in October 1871. In this appointment he served for one year. He was subsequently nominated by the democratic county convention in September 1872 for the seat he then occupied, and two days later the republican convention nominated him for the same office. Dr. Avery was duly elected. In 1877 he was re-elected to the same position under circumstances which demonstrated his great personal popularity, and was duly commissioned by Governor Hartranft January 1, 1878. He declined the nomination for a third term. Dr. Avery was always conspicuous for independent thought, positive convictions, unflinching courage, and spotless integrity, qualities which were abundantly displayed in the discharge of his official duties. His official career was marked by an active, intelligent, and conscientious discharge of his duty, and his influence was largely felt in the administration of justice.

For many years Dr. Avery was recognized as among the leading members of the dental

profession. At a period when it was generally customary to do so, Dr. Avery exhibited specimens of his handiwork at prominent exhibitions, and among others at the world's fair held in London in 1851, the first of the series since known as international expositions, and for his exhibit on that occasion he received the "Prince Albert" medal. He subsequently received medals from various American institutions.

He continued his professional labors until a short time previous to his death, being for years the oldest practicing dentist in the country, and probably in the world. As he said himself in a letter to the writer, "I have lived in all the decades of the last century and am on the last decade which will make me one hundred years old." Referring to the conditions under which he began the practice of his professional work, he writes:

"At that day there was not a dental school in the world, or any publication devoted to the interests of the art, as dentistry was then called. Our text-books were English productions, such as the work of Thomas Bell, of Guy's Hospital, London, many of whose opinions have been exploded by scientific examination, but it was the best we could do until the coming of Harris' 'Principles.' We were obliged to make our own instruments, especially excavators; for many things we had to go shopping among the surgical instrument makers for something we could use. It is hardly to be conceived the paucity of material for dental use, and the relief it was when Jones, White, & McCurdy opened their depot on Broadway, nearly opposite the City Hall, where we could find all that was most needed in dentistry. The wonderful advancement in the profession is shown when we consider the extent to which that business has grown, of which the Cosmos has been an important factor. Mark also the improvement in teeth made now and those sent to this country by the French; also the improvement in amalgam since the Crawcours introduced 'painless dentistry' by filing up the coin and mixing it with mercury, wiping out the cavity and stuffing in the mass at ten dollars a filling. There was an episode connected with their leaving as related to me by Dr. Ambler: A young lady had employed them to fill her teeth, and immediately after was taken very ill. Her parents concluded that she had been poisoned by the mercury in the amalgam. Her father procured a

warrant for their arrest, but they went on board a vessel just about to sail and escaped. He then called a committee of dentists to examine the case; they decided that amalgam was not fit to put in the mouth. Dr. Ambler, who was one of the committee, told me that he thought the filling of her teeth had nothing to do with her sickness; that it was only a coincidence.

"Many years ago there was an epidemic of malarial fever in this town, among the first symptoms of which was pain in such teeth as were liable to ache, and many came to me who after having their teeth out immediately took to their beds; many died, and others had a long run of fever. The mass, especially the less informed of the people, concluded I had done something to them which produced the fever, dentistry being as much a mystery to them as diagnosing a case of fever. The physicians, however, came to my rescue, so that I was neither mobbed nor driven out of town.

"When I commenced the practice of dentistry it was astonishing the density of the ignorance of most of the people in regard to dentistry. Some thought it was evil and only evil continually; that no man could follow the business and be a Christian. They classed it with gambling and other vices. Some unprincipled men would take advantage of that ignorance and defraud them shamefully. I knew one case where a man filled teeth with paper which was gilt on one side, so folded as to show the metal only, and charged for gold fillings. Of course he stayed but a short time at each place."

The foregoing extracts are from a personal letter dated January 15, 1902, and are quoted because of the light which they shed upon an interesting period of our professional development. One other event in the career of Dr. Avery is of interesting historical importance. The first locomotive that ever turned a wheel upon the western continent was the "Stourbridge Lion," which was built in England under the direction of Horatio Allen. It was given a trial trip on a branch of the Delaware and Hudson Railroad, at Honesdale, on August 18, 1829. Dr. Avery and a friend named Nathan Kellogg obtained permission from the engineer to ride upon the locomotive, and he was thus one of three or more individuals who first traveled by locomotive agency in America. Under date of December 19, 1902, Dr. Avery furnished an historical account of this event for record.

Dr. Avery was twice married. His first wife was Louisa, daughter of Charles and Abigail Hoel of Bethany, the marriage taking place April 19, 1829. Six children were born of this union. On March 8, 1855, he married Mary Agnes, widow of John Addoms, of New York, and daughter of Richard Clark, formerly a merchant of New York. Three children were born of this union.

His remains were interred in the Moravian Cemetery at New Dorp, Staten Island, N. Y.

DR. GASPAR A. BETANCOURT.

DIED, at his home in Havana, Cuba, February 29, 1904, from softening of the brain, DR. GASPAR A. BETANCOURT.

Dr. Betancourt was born in Puerto Principe, January 6, 1833. About the year 1857 he entered the dental office of Dr. Calder of Boston, and having mastered some of the fundamental problems of prosthetic dentistry he matriculated at the Baltimore College of Dental Surgery, where he remained for one session. Following this he removed to Savannah, Ga., where he practiced for a very short time. In the early '60's he came to Philadelphia with the purpose of taking a complete course of study, and having entered the Pennsylvania College of Dental Surgery, he was graduated from that institution with the D.D.S. degree in 1865.

Dr. Betancourt was an earnest and ardent worker in the field of his chosen profession, constantly endeavoring to elevate the status of dentistry by his contributions to dental literature and his indefatigable activity in society work. In 1868 he returned to Cuba, after a stay of six months in New York city, where in his capacity of assistant to the late W. H. Atkinson he gained valuable experience in the active field of dentistry. Dr. Betancourt was one of the first American graduates to practice dentistry in the island of Cuba, and as an exponent of scientific practice in professional work did considerable good among his countrymen, whose conceptions of dentistry at that time must have been both indefinite and incomplete. He took an active part in the educational movement

which, started in 1900, has already produced palpable results in the line of systematizing the study of dentistry and the laws governing the practice of this specialty in Cuba.

Apart from his evident interest in dentistry and his contributions to its archives of knowledge, Dr. Betancourt's mechanical genius was not restricted to that particular field, as evinced by his invention of several useful agricultural implements.

In 1857 he was married to Miss Johanna Crowley of Georgia, and after her death he married, in 1878, at New Orleans, Miss Amelia Kolinke of Mississippi.

He died a widower, and is survived by five children by his first marriage and two by his second. Dr. A. C. Betancourt, his eldest son, is a practitioner of dentistry in Havana.

"IN MEMORIAM" RESOLUTIONS.

Dr. Monroe J. Solenberger.

THE following resolutions were recently passed by the Peoria Dental Society:

Through the will of an All-wise Providence we are called upon to mourn the loss of our beloved member, Dr. Monroe J. Solenberger, whose death, from diphtheria, occurred February 28, 1904, immediately following that of his four-year-old daughter.

RESOLVED, That in the death of Dr. Solenberger the members of the Peoria Dental Society have suffered an irreparable loss. Through association with him in the past we have learned to love him as a friend, respect him for his high sense of honor, and look upon him as a consistent Christian man.

RESOLVED, That this expression of our sympathy and condolence be extended to his bereaved family, especially to his wife, who is so bravely and beautifully facing her double bereavement.

RESOLVED, That a copy of these resolutions be placed upon our records, and that copies be sent to the leading dental journals for publication, and to the faculty of Vanderbilt University.

D. H. BALDWIN,
R. L. GRABER,
E. KRAMM,

Committee.

SOCIETY NOTES AND ANNOUNCEMENTS.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization Dental Congress.

H. J. BURKHART, Chairman,
Batavia, N. Y.

E. C. KIRK, Secretary,
Lock Box 1615, Philadelphia, Pa.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer, 1420 Chestnut st., Philadelphia, Pa.

II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.

III. Chemistry and Metallurgy. Chairman, J. D. Hodgen, 1005 Sutter st., San Francisco, Cal.

IV. Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

DEPARTMENT B—APPLIED SCIENCE.

V. Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

VI. Orthodontia. Chairman, E. H. Angle, 1023 N. Grand ave., St. Louis, Mo.

VII. Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.

VIII. Prosthesis. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.

IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy, Marshall Field Bldg., Chicago, Ill.

X. Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

COMMITTEES.

Following are the committees appointed:

Finance. Chairman, C. S. Butler, 680 Main st., Buffalo, N. Y.

Program. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Exhibits. Chairman, D. M. Gallie, 100 State st., Chicago, Ill.

Transportation. (To be appointed.)

Reception. Chairman, B. Holly Smith, 1007 Madison ave., Baltimore, Md.

Registration. Chairman, B. L. Thorpe, 3666 Olive st., St. Louis, Mo.

Printing and Publication. Chairman, W. E. Boardman, 184 Boylston st., Boston, Mass.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey, 524 Penn ave., Pittsburg, Pa.

Dental Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel, 527½ Church st., Nashville, Tenn.

Membership. Chairman, J. D. Patterson, Keith and Perry Bldg., Kansas City, Mo.

Educational Methods. Chairman, T. W. Brophy, Marshall Field Bldg., Chicago, Ill.

Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

Prosthetic Dentistry. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.

Local Committee of Arrangements and Reception. Chairman, Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Essays. Chairman, Wilbur F. Litch, 1500 Locust st., Philadelphia, Pa.

History of Dentistry. Chairman, Wm. H. Trueman, 900 Spruce st., Philadelphia, Pa.

Nomenclature. Chairman, A. H. Thompson, 720 Kansas ave., Topeka, Kans.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally, 1018 14th st., N. W., Washington, D. C.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown, 175 Newbury st., Boston, Mass.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.

Prize Essays. Chairman, James Truman, 4505 Chester ave., Philadelphia, Pa.

Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.

Resolutions. Chairman, J. Y. Crawford, Jackson Bldg., Nashville, Tenn.

Clinics. Chairman, J. P. Gray, 24 Berry Block, Nashville, Tenn.

Nominations. (To be appointed.)

Ad Interim. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

The officers of the Congress, president, vice-presidents, secretary, and treasurer, will be elected by the Congress at large at the time of the meeting, and will be nominated by the Nominating Committee.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material

progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,

E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.

DAVID R. FRANCIS, *President of Exposition*.

Fourth International Dental Congress.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

J. A. LIBBEY, *Chairman*,

524 Penn Avenue, Pittsburg, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing member-

ship as prescribed by the Committee on Membership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of dentistry*. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state chairman, whose indorsement is a certification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the Committee earnestly appeals to each eligible practitioner in the United States who is interested in the success of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are—

General Chairman—J. A. LIBBEY, 524 Penn Ave., Pittsburg, Pa.

States.

- Alabama. H. CLAY HASSELL, Tuscaloosa.
- Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.
- California. J. L. PEASE, 1016 Clay St., Oakland.
- Colorado. H. A. FYNN, 500 California Bldg., Denver.
- Connecticut. HENRY McMANUS, 80 Pratt St., Hartford.
- Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.
- District of Columbia. W. N. COGAN, The Sherman, Washington.
- Florida. W. G. MASON, Tampa.
- Georgia. H. H. JOHNSON, Macon.
- Idaho. J. B. BURNS, Payette.
- Illinois. J. E. HINKINS, 131 E. 53d St., Chicago.
- Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.
- Iowa. W. R. CLACK, Clear Lake.
- Kansas. G. A. ESTERLY, Lawrence.
- Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.
- Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.
- Maine. H. A. KELLEY, 609 Congress St., Portland.
- Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.
- Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.
- Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.
- Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.
- Mississippi. W. R. WRIGHT, Jackson.
- Missouri. J. W. HULL, Altman Bldg., Kansas City.
- Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.
- New Hampshire. E. C. BLAISDELL, Portsmouth.
- New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.
- New York. B. C. NASH, 142 W. 78th St., New York City.
- North Carolina. C. L. ALEXANDER, Charlotte.
- Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.
- Oklahoma. T. P. BRINGHURST, Shawnee.
- Oregon. S. J. BARBER, Macleay Bldg., Portland.
- Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.

Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.

South Carolina. J. T. CALVERT, Spartanburg.

South Dakota. E. S. O'NEIL, Canton.

Tennessee. W. P. SIMS, Jackson Bldg., Nashville.

Texas. J. G. FIFE, Dallas.

Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.

Vermont. S. D. HODGE, Burlington.

Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.

Washington. G. W. STRYKER, Everett.

West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.

Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.

For the Committee of Organization,

EDWARD C. KIRK, *Secretary*.

DENTAL SOCIETY MEETINGS: April, May, June, July, and August 1904.

APRIL.

CONNECTICUT STATE DENTAL ASSOCIATION. Hartford. Two days: April 19th and 20th.

MISSISSIPPI DENTAL ASSOCIATION. Jackson. Three days: April 19th to 21st.

UTAH DENTAL ASSOCIATION. Salt Lake City. Two days: April 8th and 9th.

MAY.

ALABAMA DENTAL ASSOCIATION. Anniston. Beginning May 10th.

CALIFORNIA STATE DENTAL ASSOCIATION. San Francisco. Four days: May 16th to 19th.

FLORIDA STATE DENTAL SOCIETY. Atlantic Beach. Beginning May 25th.

ILLINOIS STATE DENTAL SOCIETY. Peoria. Three days: May 10th to 12th.

INDIANA (EASTERN) DENTAL ASSOCIATION. Richmond. First week in May.

IOWA STATE DENTAL ASSOCIATION. Des Moines. Three days: May 3d to 5th.

KANSAS STATE DENTAL ASSOCIATION. Topeka. Three days: May 12th to 14th.

KENTUCKY STATE DENTAL ASSOCIATION. Louisville. Three days: May 17th to 19th.

MISSISSIPPI VALLEY DENTAL ASSOCIATION. Date not yet announced.

NEW HAMPSHIRE DENTAL SOCIETY. Concord. Two days: May 10th and 11th.

NEW YORK STATE DENTAL SOCIETY. Albany. Two days: May 13th and 14th.

SIXTH DISTRICT DENTAL SOCIETY, STATE OF NEW YORK. Binghamton. Two days: May 5th and 6th.

OKLAHOMA DENTAL ASSOCIATION. Shawnee. Three days: May 10th to 12th.

TENNESSEE STATE DENTAL ASSOCIATION. Jackson. Three days: May 26th to 28th.

TEXAS STATE DENTAL ASSOCIATION. Corsicana. Three days: May 5th to 7th.

WASHINGTON STATE DENTAL SOCIETY. Seattle. Three days: May 26th to 28th.

JUNE.

GEORGIA STATE DENTAL SOCIETY. Athens. Beginning June 28th.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: June 14th to 16th.

MASSACHUSETTS DENTAL SOCIETY. Boston. Two days: June 1st and 2d.

MINNESOTA STATE DENTAL ASSOCIATION. St. Paul. Three days: June 16th to 18th.

NORTH CAROLINA STATE DENTAL SOCIETY. Morehead City. Three days: June 22d to 24th.

NORTHERN OHIO DENTAL ASSOCIATION. Cleveland. Three days: June 7th to 9th.

SOUTHERN WISCONSIN DENTAL ASSOCIATION. Beloit. Two days: June 8th and 9th.

JULY.

MAINE DENTAL SOCIETY. Bangor. Three days: July 19th to 21st.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 21st to 23d.

WISCONSIN STATE DENTAL SOCIETY. Manitou. Three days: July 19th to 21st.

AUGUST.

FOURTH INTERNATIONAL DENTAL CONGRESS. St. Louis, Mo. Six days: August 29th to September 3d.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. St. Louis. Three days: August 25th to 27th.

State Board Meetings.

ALABAMA BOARD OF DENTAL EXAMINERS. Anniston. May 9th.

ARKANSAS BOARD OF DENTAL EXAMINERS. Little Rock. May 10th to 12th.

CALIFORNIA STATE BOARD OF DENTAL EXAMINERS. San Francisco, May 23d, and Los Angeles, June 13th.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS. Chicago. May 6th and 7th.

MARYLAND BOARD OF DENTAL EXAMINERS. Baltimore. May 4th and 5th.

MICHIGAN BOARD OF DENTAL EXAMINERS. Grand Rapids. May 10th.

MINNESOTA BOARD OF DENTAL EXAMINERS. Minneapolis. April 5th to 7th.

MONTANA BOARD OF DENTAL EXAMINERS. Helena. June 6th, 7th, and 8th.

NEBRASKA BOARD OF DENTAL EXAMINERS. Omaha. April 27th to 29th.

NEW JERSEY BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY. Trenton. July 5th to 7th.

OKLAHOMA BOARD OF DENTAL EXAMINERS. Shawnee. May 9th and 10th.

TENNESSEE BOARD OF DENTAL EXAMINERS. Jackson. May 26th to 28th.

TEXAS BOARD OF DENTAL EXAMINERS. Corsicana. May 9th.

NEW YORK COLLEGE OF DENTISTRY.

REUNION—CLASS OF '95.

THE regular annual reunion of the class of '95, New York College of Dentistry, will be held Saturday evening, April 16, 1904. Members of the classes of '94 and '96 are cordially invited to participate.

Full particulars will be sent to all members of these classes sending their addresses to

F. C. BRUSH, *Chairman*,
1183 Broadway, N. Y.

MISSISSIPPI DENTAL ASSOCIATION.

THE Mississippi Dental Association will hold its next annual meeting in the new million-dollar Capitol, Jackson, Miss., on April 19, 20, and 21, 1904.

A profitable as well as a pleasant time is anticipated.

Reduced railroad rates on the certificate plan.

T. B. WRIGHT, *Sec'y*, Hattiesburg, Miss.

UTAH DENTAL ASSOCIATION.

THE Utah Dental Association will hold its eleventh annual meeting and clinic in Salt Lake City on April 8 and 9, 1904. A cordial invitation is extended to all ethical practitioners of the dental profession to attend.

S. W. WHERRY, *Sec'y*, Ogden, Utah.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE fortieth annual convention of the Connecticut State Dental Association will be held at Hartford, Conn., on Tuesday and Wednesday, April 19 and 20, 1904.

FREDERICK HINDSLEY, *Sec'y*, Bridgeport, Conn.

ALUMNI ASSOCIATION OF THE KANSAS CITY DENTAL COLLEGE.

THE Alumni Association of the Kansas City Dental College will hold their annual meeting at 2 P.M. on Saturday, April 30, 1904, at the college building. All graduates are invited to be present and participate in a musical and literary program.

The banquet will be held the same evening, after the commencement exercises.

J. P. ROOT, *Pres.*,
T. E. PURCELL, *Sec'y*,
Kansas City, Mo.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting of the New York State Dental Society will be held at Hotel Ten Eyck, Albany, N. Y., May 13 and 14, 1904.

Special rates have been secured at the hotels Ten Eyck and The Kenmore; also special railroad rates on the certificate plan with the Trunk Line Association.

The business committee have prepared a most excellent program, and assure to all who attend an unusually instructive and interesting meeting, with essays by the following well-known and prominent men of the profession: "Porcelain," E. N. Jenkins, Dresden, Ger.; Joseph Head, Philadelphia; C. H. Land, Detroit. "Pyorrhea Alveolaris: Its Causes, Sequelæ, and Cure," D. D. Smith, Philadelphia. "Prophylaxis," Geo. E. Hunt,

Indianapolis, Ind. "Gold as a Filling Material: Is It Still Important?" B. Holly Smith, Baltimore, Md. (Subject to be announced) W. J. Turner, Brooklyn, N. Y. "Our State Society: A Study and an Appeal," C. W. Stainton, Buffalo, N. Y. "The Pericementum" (with lantern slide demonstration), I. L. M. Waugh. (Subject to be announced) M. H. Cryer, Philadelphia.

Fellow practitioners conversant with the various subjects announced will open the discussions.

Exhibitors desiring space will please address Dr. J. L. Appleton, 89 Columbia st., Albany, N. Y.

R. H. HOFHEINZ, *Pres.*,
Rochester, N. Y.
W. A. WHITE, *Sec'y*,
Phelps, N. Y.

FLORIDA STATE DENTAL SOCIETY.

THE twenty-first annual meeting of the Florida State Dental Society will be held at Atlantic Beach, May 25, 1904.

J. EDWARD CHACE, *President*,
D. D. BEEKMAN, *Sec'y*.

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association will hold its twenty-fourth annual session at Corsicana, Texas, May 5, 6, and 7, 1904.

All ethical members of the profession are invited to meet with us.

BUSH JONES, *Sec'y*,
Dallas, Texas.

ILLINOIS STATE DENTAL SOCIETY.

THE fortieth annual meeting of the Illinois State Dental Society will be held at Peoria, Tuesday, Wednesday, and Thursday, May 10, 11, and 12, 1904. A splendid program, including attractive and unusually interesting features, is in course of preparation. The usual fare of one and one-third, certificate plan, will be obtained on all roads in the state, and from St. Louis. Remember the date. All reputable practitioners are cordially invited.

HART J. GOSLEE, *Sec'y*, Chicago, Ill.

KANSAS STATE DENTAL ASSOCIATION.

THE Kansas State Dental Association will hold its thirty-third annual meeting in Topeka, Kans., on May 12, 13, and 14, 1904.

GEO. A. ESTERLY, Lawrence, Kans.

OKLAHOMA DENTAL ASSOCIATION.

THE fourteenth annual meeting of the Oklahoma Dental Association will be held at Shawnee, Oklahoma, May 10, 11, and 12, 1904.

THEO. P. BRINGHURST, *Sec'y*, Shawnee, Okla.

ALABAMA DENTAL ASSOCIATION.

THE Alabama Dental Association will hold its next annual meeting in Anniston, Ala., beginning on the second Tuesday in May, 1904.

L. A. CRUMLY, *Sec'y*,
First Nat'l Bank B'd'g, Birmingham, Ala.

SIXTH DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

THE thirty-sixth annual meeting of the Sixth District Dental Society of the State of New York will be held at the Hotel Bennett, Binghamton, N. Y., on May 5 and 6, 1904.

FREDERIC W. MCCALL, *Sec'y*,
Binghamton, N. Y.

CALIFORNIA STATE DENTAL ASSOCIATION

AND THE

ALUMNI ASSOCIATION OF THE DENTAL DEPARTMENT, UNIVERSITY OF CALIFORNIA.

THE California State Dental Association and the Alumni Association of the Dental Department of the University of California will meet jointly in annual session, May 16 to 19, 1904.

Eastern specialists on porcelain and orthodontia have been invited to give a course of instruction on their several subjects at this session, and efforts are being made to eclipse all previous sessions from the standpoint of progress and interest to the profession.

GUY S. MILLBERRY, *Sec'y Joint Com.*,
1202 Sutter st., San Francisco, Cal.

KENTUCKY STATE DENTAL ASSOCIATION.

THE coming annual meeting of the Kentucky State Dental Association promises a dental convention of unusual interest. To be held in Louisville, May 17, 18, and 19, 1904.

Members of the profession are extended a hearty welcome.

W. M. RANDALL, *Sec'y*,
Masonic Building, Louisville, Ky.

TENNESSEE STATE DENTAL ASSOCIATION.

THE Tennessee State Dental Association will hold its thirty-seventh annual meeting at Jackson, Tenn., May 26, 27, and 28, 1904. All ethical practitioners of the dental profession are cordially invited to attend.

R. BOYD BOGLE, *Pres.*, Nashville, Tenn.,
J. T. CREWS, *Sec'y*, Jackson, Tenn.

NEW HAMPSHIRE DENTAL SOCIETY.

THE New Hampshire Dental Society will hold its annual meeting at Concord, N. H., Tuesday and Wednesday, May 10 and 11, 1904.

All members of the profession are invited to be present.

FRED F. FISHER, *Sec'y*, Manchester, N. H.

INDIANA DENTAL ASSOCIATION.

THE Indiana Dental Association will meet in Indianapolis, Ind., June 14, 15, and 16, 1904. A fine meeting is expected.

A. T. WHITE, *Sec'y*, New Castle, Ind.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

THE tenth annual meeting of the Southern Wisconsin Dental Association will convene in Beloit, Wisconsin, June 8 and 9, 1904. We anticipate a pleasant as well as a profitable meeting, and a cordial invitation is extended to all.

C. W. COLVER, *Sec'y*, Clinton, Wis.

MINNESOTA STATE DENTAL ASSOCIATION.

THE twenty-first annual meeting of the Minnesota State Dental Association will be held in St. Paul, June 16, 17, and 18, 1904.

GEO. S. TODD, *Sec'y*, Lake City, Minn.

NORTHERN OHIO DENTAL ASSOCIATION.

THE forty-fifth annual meeting of the Northern Ohio Dental Association will be held at the Western Reserve University Dental College, Cleveland, Ohio, June 7, 8, and 9, 1904. An interesting program is assured. You are specially invited to attend.

C. D. PECK, *Sec'y*, Sandusky, Ohio.

MASSACHUSETTS DENTAL SOCIETY.

THE fortieth annual meeting of the Massachusetts Dental Society will be held in the Massachusetts Charitable Mechanic Association Building, Huntington ave., Boston, Mass., June 1 and 2, 1904.

EDGAR O. KINSMAN, *Sec'y*,
15 Brattle Sq., Cambridge, Mass.

NEW JERSEY STATE DENTAL SOCIETY.

THE New Jersey State Dental Society will hold its annual convention in the Auditorium, at Asbury Park, N. J., July 21 to 23, 1904.

Intending exhibitors should apply direct to the chairman of the Exhibit Committee,

W. G. CHASE, Princeton, N. J.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

THE next regular meeting of the Illinois State Board of Dental Examiners to examine applicants for license to practice dentistry in this state will be held in Chicago, May 6 and 7, 1904.

Under an opinion of the attorney-general the following are eligible to take the examination before the Board: "Anyone holding a medical diploma from a reputable medical college; anyone who has been a legal practitioner of dentistry for ten years prior to moving into the state, and anyone who failed

to register in this state at the time the law went into effect, which was in 1881."

Candidates must furnish their own patients, and come provided with the necessary instruments, rubber-dam, and gold to perform practical operations and such other work as is deemed advisable by the Board. Those desiring to take the examination should matriculate with the secretary at least ten days before the date of meeting. The examination fee is \$10.00. Any further information can be obtained by addressing

J. G. REID, *Sec'y*,
1204 Trude Bldg., 67 Wabash ave., Chicago.

TEXAS BOARD OF DENTAL EXAMINERS.

THE Texas State Board of Dental Examiners will hold its next examination in Corsicana, Texas, beginning on May 9, 1904, at 10 A.M.

For further information address

C. C. WEAVER, *Sec'y*, Hillsboro, Texas.

CALIFORNIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of California will hold its next examination in San Francisco, commencing on May 23, 1904, and will also hold an examination in Los Angeles, commencing on June 13, 1904.

F. G. BAIRD, *Sec'y*.

MARYLAND STATE BOARD OF DENTAL EXAMINERS.

THE Maryland Board of Dental Examiners will meet for examination of candidates on May 4 and 5, 1904, at the Baltimore College of Dental Surgery, at 9 A.M. Candidates must pass a written examination in anatomy and physiology, pathology, therapeutics, and materia medica, operative and mechanical dentistry, chemistry and bacteriology, and oral surgery; must insert a gold filling in the mouth, and exhibit specimens of prosthetic work properly vouched for. Application blanks properly filled, accompanied with the fee of ten dollars, must be filed with the secretary prior to May 4th.

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

NEBRASKA BOARD OF DENTAL EXAMINERS.

THE next meeting of the Nebraska State Board of Dental Examiners for the examination of applicants will be held in Omaha, Neb., April 27, 28, and 29, 1904. Applications and all necessary information will be furnished by

W. N. DORWARD, *Sec'y*,
405 Paxton Block, Omaha, Neb.

MONTANA BOARD OF DENTAL EXAMINERS.

THE annual meeting of the Montana Board of Dental Examiners will be held in Helena, Mont., June 6, 7, and 8, 1904. Application blanks may be obtained from the secretary. Applicants must furnish all materials for demonstration.

D. J. WAIT, *Sec'y*, Helena, Mont.

MINNESOTA BOARD OF DENTAL EXAMINERS.

THE Minnesota State Board of Dental Examiners will meet for the purpose of examining applicants for license on April 5, 6, and 7, 1904. No application received after 12 M., April 5th.

Meeting will be held at the dental department of State University at Minneapolis.

C. H. ROBINSON, *Sec'y*,
Wabasha, Minn.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE next meeting of the Arkansas State Board of Dental Examiners will be held May 10, 11, and 12, 1904, in Little Rock, Ark., for the examination of all applicants. Those having applied for examination will report to the secretary Tuesday morning, May 10, 1904, with rubber dam, gold, plastic filling material, and instruments, to demonstrate their skill in operative dentistry. Anyone who wishes may bring his patient; so far as possible patients will be furnished. The board will select the cavity to be filled. The examination will cover all branches of the dental profession. No temporary certificates are issued at any time. Examination fee, fifty dollars. For further information write the secretary.

A. T. McMILLIN, *Sec'y*, Little Rock, Ark.

OKLAHOMA BOARD OF DENTAL EXAMINERS.

THERE will be a meeting of the Oklahoma Board of Dental Examiners held at Shawnee, Oklahoma, on Monday and Tuesday, May 9 and 10, 1904, for the purpose of examining candidates for license, and such other business as may properly come before it. For particulars regarding registration apply to

A. C. HIXON, *Sec'y*, Guthrie, Oklahoma.

ALABAMA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners for the State of Alabama will meet in Anniston, Ala., on Monday before the second Tuesday in May, 1904. In addition to the regular written examination, the following requirements will be added, viz: Each applicant must fill at least two teeth, approximal cavities, one with gold, the other with alloy, work to be done under the immediate supervision of the board; the board to determine or pass on suitable selections of cavities. The board will try to furnish subjects, but failing to do so, applicants for license must find or bring their own subjects, also instruments and material. Each applicant must bring a partial upper denture—not less than eight teeth—ready for soldering, hard solder required, which work must also be done under supervision of the board.

THOS. P. WHITBY, *Sec'y*, Selma, Ala.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the theoretical branches in the assembly room of the State house at Trenton, N. J., on July 5, 6, and 7, 1904, sessions beginning promptly at 9 A.M.

The practical prosthetic and practical operative work will be done in Newark. All applications must be in the hands of the secretary ten days prior to the examination.

For further information apply to

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their annual meeting in the Coliseum building, corner Thirteenth and Olive streets, St. Louis, Mo., on the 25th, 26th, and 27th of August, beginning promptly at 10 A.M.

Telephone and telegraph offices in the building. Hotel accommodations will be secured for the members.

CHAS. A. MEEKER, *Sec'y and Treas.*

Special Notice.

NOTICE TO MEMBERS OF THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

IT will be necessary for the secretaries of all those members of the National Association of Dental Examiners who desire copies of the proceedings of the meeting held in 1903 at Asheville, N. C., to send in their names and addresses to the undersigned.

The secretary does not possess occult powers and but nineteen states have responded as the result of two notices in the journals during the foregoing year.

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

ARMY DENTAL CORPS.

H. Q. DEP'T OF THE LAKES: PAR. 1, S. O. 17.—Upon the recommendation of the chief surgeon of the department, Contract Dental Surgeon William C. Fisher, now at Fort Wayne, Michigan, will proceed at once to Fort Thomas, Kentucky, accompanied by the enlisted man detailed as his assistant, and report to the commanding officer, to attend as quickly as possible to the emergency work at the post (in no event remaining there more than one month), upon the completion of which he will proceed to Fort Brady, Michigan, reporting upon arrival to the commanding officer of that post for duty. It being contemplated that Contract Dental Surgeon Fisher's tour of duty at Fort Brady be limited to one month, he will at the expiration of that period apply, through the post com-

mander, to these headquarters for further orders.

The Quartermaster's Department is authorized to ship by express such appliances and supplies as Contract Dental Surgeon Fisher may need for immediate use.

The travel herein directed is necessary for the public service. (February 2d.)

ONTARIO DENTAL SOCIETY.

At the meeting of the Ontario Dental Society, held in Ontario, February 9, 10, and 11, 1904, the following officers were elected: R. E. Sparks, Kingston, honorary president; A. W. Thornton, Chatham, president; J. R. Mitchell, Perth, vice-president; Guy G. Hume, Toronto, secretary; R. Gordon McLean, Toronto, treasurer; W. H. Willmott, Toronto, archivist. Program Committee—A. E. Webster, Toronto; G. Martin, W. C. Trotter, R. G. McLaughlin, W. Secombe. District Representatives—No. 1, A. A. Smith, Cornwall; No. 2, W. Adams, Whitby; No. 3, A. W. Spaulding, Toronto; No. 4, F. Hansel, Hamilton; No. 5, P. P. Ballachey, Brantford; No. 6, W. A. Brownlee, Mount Forest; No. 7, A. S. Santo, London.

G. G. HUME, *Sec'y*,
228 Carlton st., Toronto, Ont.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

At the annual meeting of the Central Dental Association of Northern New Jersey, held at Newark, February 15, 1904, the following officers were elected: C. S. Stockton, Newark, president; T. Star Dunning, Paterson, vice-president; H. Parker Marshall, Newark, secretary; C. A. Meeker, Newark, treasurer. Executive Committee—R. S. Sanger, East Orange, chairman; W. Moore Gould, Newark, secretary; N. M. Chitterling, Bloomfield; Frank L. Manning, Red Bank; Frederick W. Stevens, Newark.

F. W. STEVENS.

MONTANA STATE DENTAL SOCIETY.

The first annual meeting of the Montana State Dental Society was held in Helena, Montana, February 22 and 23, 1904, when the following officers were elected for the ensuing year: W. H. Barth, president; J. D. Sutphen, first vice-president; Jos. Gettinger, second vice-president; Geo. E. Longeway, secretary; W. M. Billings, treasurer.

The second annual meeting will be held in Butte, Mont., February 20 and 21, 1905.
GEO. E. LONGEWAY, *Sec'y*, Great Falls, Mont.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING FEBRUARY 1904.

February 9.

- No. 751,493, to JACOB F. FUNCK. Vulcanizer.
- No. 751,582, to ROBERT WALKER. Strengtheners for vulcanite artificial teeth bases.
- No. 751,592, to THOMAS H. WHITESIDE. Artificial tooth-crown mounting.
- No. 751,950, to WARREN M. SHARP. Dental mouth-mirror.

February 16.

- No. 752,114, to LEONIDAS SENNETT and ABRAHAM L. MOORE. Breath-guard.

February 16 (continued).

- No. 752,378, to WILBER M. DAILEY. Method of casting impressions of teeth.

February 23.

- No. 752,703, to CAMERN E. ORNDORF. Controlling device for vulcanizers or like apparatus.
- No. 753,128, to OWEN E. DRISCOLL. Dental plate mold.

THE DENTAL COSMOS.

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No. 5.

ORIGINAL COMMUNICATIONS.

ORIGIN, USE AND MISUSE OF THE INTERMAXILLARY FORCE, AND ITS RELATIONS TO OCCIPITAL AND OTHER ANCHORAGE FORCES IN ORTHODONTIA.

By CALVIN S. CASE, M.D., D.D.S., Chicago, Ill.

ORIGIN OF THE INTERMAXILLARY FORCE.

IN 1892 Dr. J. H. Prothero, who was then my assistant, and is now professor of prosthetic dentistry in the Northwestern University Dental School of Chicago, constructed under my direction the first "contouring apparatus" for a case that required the bodily protrusion of the upper teeth. (See Fig. 1, page 346.) As the case also demanded the retraction of the lower teeth, the apparatus was so constructed as to employ as an auxiliary the buccal intermaxillary elastic force which I had previously used in other cases.

A description of this case, illustrated with models, apparatus, and charts, was first presented by me at the February 1893 meeting of the Chicago Dental Society, and was published with illustrations in the March 1893 number of the *Dental Review*. The following quotation from that paper refers in detail to the employment of the intermaxillary force:

"A very important additional force to this apparatus was obtained by the use of rubber bands, as follows: To the buccal surfaces of

the most posterior extensions of the upper appliances were soldered large-headed buttons from which extended rubber bands of considerable tension to similar buttons on the lower bar in the vicinity of the bicuspid. The horizontal position of these bands prevented them from materially interfering with the movement of the jaws, and therefore they were worn continuously, greatly relieving the load upon the anchorages by reciprocating the opposing forces used on the anterior teeth. . . . In connection with this, small rubber bands extended from the lower bar to the superior [front] teeth, that were far out of occluding alignment. These were removed by the patient during the process of mastication, but worn at all other times.

"I here present the models with a similar apparatus attached to the teeth, that was worn by the patient. The rubber bands are not attached, but the buttons and hooks will show where they belong. (See A, A, Fig. 5" [i.e. Fig. 1, page 346*].)

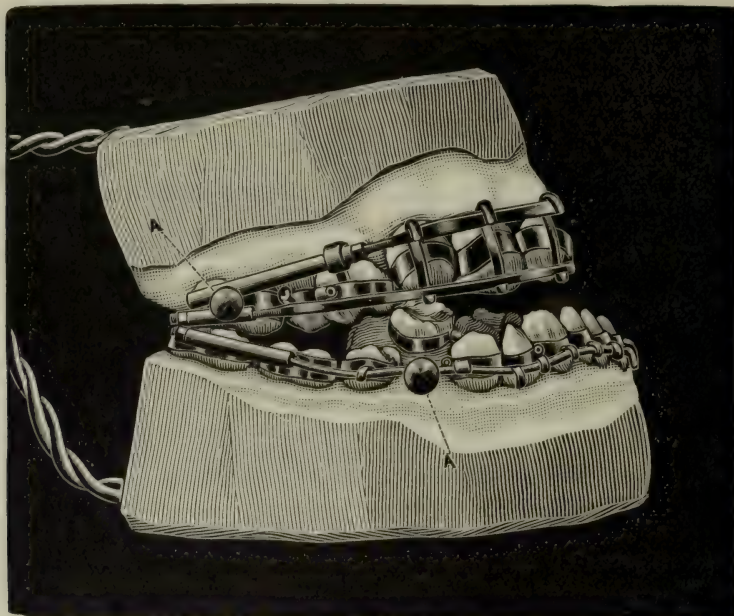
* [It should be remembered that this illustration represents the very first contouring apparatus that was ever constructed, and consequently was exceedingly primitive, cumbersome, and (beyond the principle of applying reciprocating forces to a single tooth) unmechanical in its construction as compared

At that meeting, among the many who discussed my paper, Dr. G. V. Black said as follows:

"The apparatus Dr. Case has put on here is a very elegant one, and particularly those *elastic ligatures pulling in the particular direction which you see*. As I sat here and looked at the pictures a thought came to my mind, that, taking the proportions, the posi-

the glenoid cavity or ramus of the bone very largely, bringing the whole body of the lower jawbone backward, and correcting the irregularity in that way [by the elastic bands]. Bringing the lower jawbone backward and the teeth with it, we get on toward the occlusion of the front teeth very rapidly, and the measurement of the cast seems to indicate that the whole body of the lower jaw has been thrown back one-quarter of an inch."

FIG. 1.



tion of the lower jaw, the position of the lip, the evident improvement seemed to be from something else than the movement of the teeth. I was anxious to measure the cast, which I did the best I could as they were passed along, and it seems to me that the irregularity is not corrected by the movement of the teeth entirely, but the movement is in

with those which followed it—and which today, in practical application, would hardly be recognized as the same apparatus—shown in the "American Text-book of Operative Dentistry" and elsewhere. It is therefore painful to me to see this illustration copied, as it is in some text-books, as a fair representation of the contouring apparatus, because it cannot help but retard the employment of this great and true principle of applying force in the regulation of teeth. For this reason I have

In another paper presented at the International Dental Congress of 1893, in describing the methods I employed, I referred to the intermaxillary elastic force as follows:

"The principal force therefore should be exerted upon the anterior superior teeth; and

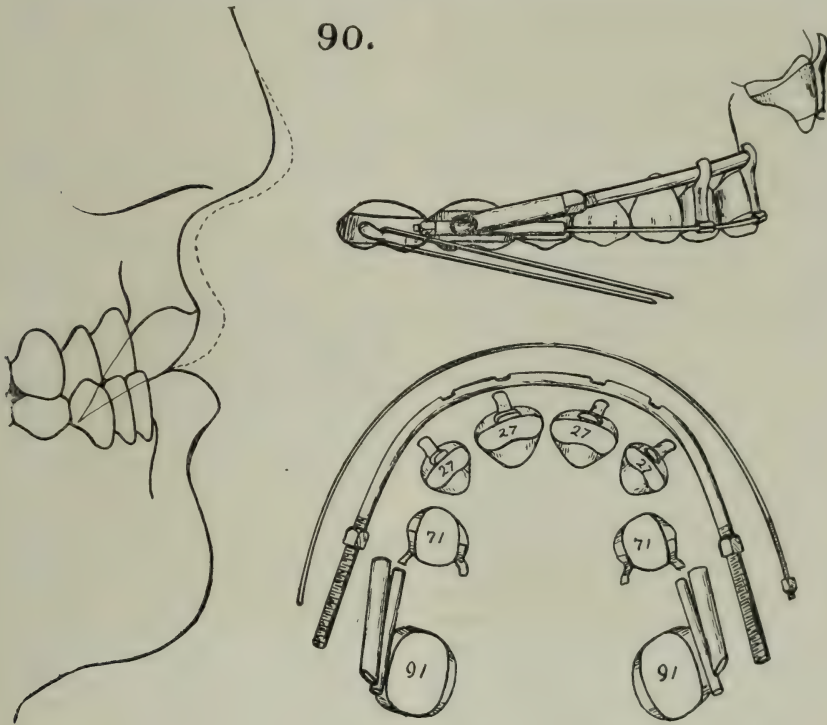
decided to show in detail one of the common forms of contouring apparatus that are now in use for bodily protruding the incisor teeth. (See Fig. 2.) I wish to say in its behalf that when properly constructed and fitted it is worn with less discomfort to the patient than the majority of regulating apparatus. Its treatment-adjustments are simple, the application of force positive, and the rapidity and direction of movement sure, and at all times under the perfect control of the operator.]

this force may be reciprocated by rubber bands, extending from the posterior part of the upper appliance to the anterior part of an appliance that is attached firmly to all the lower teeth. These bands can be made to exert almost any desired force, according to the heft of the tubing from which they are cut; and their [horizontal] position being such as not to interfere with mastication they can be worn continuously.

satisfaction from this operation that others claim. I find, however, that the rubber bands before mentioned, extending from the upper to the lower appliance, can be made to exert all the force the patient can stand at the glenoid fossæ, and doubtless this influence tends to force the lower jaw to a more posterior position.

"In considering the mechanical qualities of the contouring apparatus I have outlined, I

FIG. 2.



"If the inferior dental arch is large, with the teeth occluding outside of the alignment of the superiors, it may be reduced in size by the extraction of a bicuspid on either side, and the anterior teeth forced back to fill the space. (See Case I, Figs. 7 and 8.) If, however, the chin is abnormally prominent below the incisive fossæ, teeth should not be extracted from the lower jaw; the principal change to correct the facial deformity should be accomplished on the upper jaw, as in Case V.

"I have abandoned all attempts to reduce a prognathous lower jaw by external pressure upon the chin, never having derived the same

wish to direct attention to the fact that the force expended at the anchorage attachments is largely neutralized by the reciprocating influence of the two forces, and this reciprocation is always equal to the power used on the fulcrum bar, in preventing a [distal] movement of the occluding ends of the crowns. The balance of the power, which may be considerable in the general movement of the parts, must be sustained by the anchorage teeth if not further neutralized by other auxiliaries.

"When the central features of the face are depressed with anterior superior teeth occluding posteriorly to the lowers, accompanied with the usual real or apparent prognathous

lower jaw, great reciprocating force may be beneficially obtained from the rubber bands before mentioned. Rubber rings are cut from a three-eighths inch rubber regulating tube of good heft, and passed over the projecting ends of the anchorage tubes or buttons on the upper appliance to buttons on a lower appliance opposite the first bicusps. (See A, A, Fig. O [*i.e.* Fig. 1, page 346].) The latter appliance may be so constructed that the force will be distributed to all the inferior teeth and indirectly to the jaw, forcing it to a more posterior position. Or it may be that the first bicusps have been extracted, as in Case I, for the purpose of forcing the six anterior teeth back. In either case the elastic force of the rubber bands can be made to do effective work to the full extent of their power on both the upper and lower jaws, neutralizing force which would otherwise be expended upon a static anchorage.

"They are useful also as an auxiliary in the reduction of a prognathous upper jaw, by reversing their attachments. In these cases I also make use of the occipital force, largely for the advantage I obtain in forcing the anterior teeth farther into their sockets."

For the last twelve years I have constantly employed and taught this important principle of applying force whenever it has been indicated. In my 1893 papers and in numerous papers presented since at some of the most prominent dental societies of the United States, and published broadcast to the world, I have repeatedly referred to the reciprocating importance of the intermaxillary elastic bands, often with full descriptions of their use and application in every way. Therefore it was somewhat of a surprise to me to find in Dr. E. H. Angle's recently published book, entitled "Malocclusion of the Teeth," that the author gives the credit of the origin of this method to Dr. H. A. Baker, as follows:

"Dr. H. A. Baker of Boston, in a case belonging to this class—that of his son, illustrated in Fig. 255—employed a novel and valuable method of exerting force for the reduction of protruding upper incisors, using for anchorage the teeth of the lower jaw, and exerting force by means of heavy elastic ligatures, one end being secured to the author's arch B in front of the small immovable collars in the usual way, the other end being drawn back and hooked over the distal ends

of the tubes of the D bands on the lower second molars, these tubes also being used to support the ends of the expansion arch, which served the double purpose of correcting some slight malarrangement of the teeth of the lower arch, as well as reinforcing the teeth used as anchorage."

The author then describes at some length his own application and variations of this new (?) and "novel" method of applying force, the principles of which I had been prominently publishing for seven or eight years before the publication of his book, and yet in no place does he even mention my name in connection with it, closing his description with—

"The extent of usefulness of the Baker form of anchorage cannot be well estimated."

When this came to my notice, I immediately wrote to Dr. Baker (October 2, 1902), asking him to "kindly direct me to the periodical or text-book where he first published the idea" of the intermaxillary force. He replied (October 9, 1902) that it would be "considerable trouble in looking up the records of the different societies throughout New England," and wished to know first why I wanted the information.

Not wishing to put him to so much trouble, I then wrote to Dr. Angle, believing that he could easily furnish me with the data I desired.

His letter and reply is referred to in the following correspondence between Dr. Baker and myself, some of which I shall take the liberty to give in full, because it clearly shows that which I wish to express in this connection relative to the status of conditions unfortunately too prevalent in the dental profession—*i.e.* the tendency to ignore, belittle, divert, and appropriate the work of others. It will be seen, moreover, that my great desire was to obtain the truth—which, so far as I knew at the time, demanded a public apology from me for the seeming attempt to rob Dr. Baker of the honor of originating an important principle in orthodontia.

After waiting some time for a reply to my letter to Dr. Angle, I wrote Dr. Baker the following letter:

CHICAGO, ILL., November 10, 1902.

Dr. HENRY A. BAKER, Boston, Mass.

Dear Doctor,—I have delayed answering your letter of October 9th with the hope that I might hear from Dr. Angle, to whom I immediately wrote asking him to furnish me with the *published data* upon which he based his statement in his text-book, that you were the originator of the reciprocal force methods referred to; but for some reason he does not reply.

I must admit that I am somewhat surprised that there is any hesitation or difficulty in furnishing me with the dates I ask. When it is remembered that Dr. Angle's book is a recent publication and that you are about the only man, besides himself, to whom he has given credit for originating anything in orthodontia which he believes is worth much, therefore he must (*or should*) have founded his statement on some published article or paper of yours.

You know, Doctor, we have all talked about a great many of the good things of dentistry, long before we or someone else published them. But that is not the question I am asking, nor is it properly a question in the making of history. I should be very loath to ask you to "look up the records of the various societies throughout New England," nor would it be of any use to me, unless you mean the *published* proceedings of these societies, that could (*or should*) only be used as legitimate data.

I may perhaps be excused for imagining that a method in orthodontia which Dr. Angle considered important, though presented by someone else, would naturally be considered by the originator of sufficient importance to lead him to remember when and where it was first published. But as you seem to be in doubt as to this, I am unwilling to ask you to go to especial trouble to ascertain that which Dr. Angle would easily be able to furnish.

Sincerely thanking you for your letter and your willingness to assist me in this matter, I am,

Sincerely yours,

C. S. CASE.

BOSTON, November 24, 1902.

Dr. C. S. CASE, Chicago, Ill.

Dear Doctor,—Yours of the 10th duly received, and in reply I will say I stand just where I did in answer to your former letter.

I asked you for your reason in asking data, for, as I said, I probably could answer you accurately enough to serve your purpose, but you seem to avoid it. I infer from your cor-

respondence that there is a doubt in your mind about my being the originator of the reciprocal intermaxillary elastics for protruding and receding jaws.

Now if this is the fact, I could take my oath that they were original with me. I never heard or even had intimation of their having been used before I used them. I do not mean to infer they were never used, but I will say this: If anyone has used them before me, and obtained the effectual results that I have, and not informed the profession, he has not done his duty by it. If you have ever used them and think you are the originator, it is the farthest from my mind to get your dates and then antedate you, but if you knew what I have been through in regard to some of my inventions, you would not blame me for being cautious. I will give you a sample of it by the inclosed copy of the letter I received directly after I published an article in the *Cosmos*, entitled "An Appliance for Congenital Cleft Palate," from a paper I read before the Massachusetts Dental Society, December 9, 1880, and if you will take the trouble to look up "Garretson's System of Oral Surgery," fourth edition, on pages 468 and 469, you will see to whom the credit of the invention is given; also, by the letter, to whom the credit belongs.

Now, as far as Dr. Angle is concerned in the matter, I do not see how he can in any way be to blame. When he first came to see me about my system in orthodontia I gave this method to him, among others, as my invention. I informed him that I had used it with the very best results. He was a little skeptical as to its efficiency, but said he would try it, which he did in eight or ten cases, before publishing it. To get at this thing honestly and squarely, as you were the first to broach the subject of data, it is your place, if you have used this method and have brought it before societies, or published it, to state your dates and send your publications, or—as the old saying goes—"forever hold your peace." Then I should consider it my duty to look up my data and send them to you.

Trusting that you will look at this in the proper light and in a professional way, I am

Yours sincerely,

HENRY A. BAKER.

CHICAGO, ILL., January 2, 1903.

Dr. HENRY A. BAKER, Boston, Mass.

Dear Doctor,—In reply to yours of the 24th November, I wish to say that I did not ask or expect that you would take the trouble

to answer my last letter; nor did I realize until receiving your reply why it was that you refrained from answering my very simple and certainly civil question. But now that I know that it was because you suspected that I was some hobo, who would attempt to "antedate" you, and that you considered that you must be "cautious," I am only too glad to tell you frankly that I am writing a text-book on Orthodontia, and that I wish earnestly to give credit where it belongs.

I must admit that I was just a little surprised that Dr. Angle in giving credit to you, and in his whole treatment of this method, which he has adopted as an important part of his system of regulating, did not mention even in a casual way the name of one Calvin S. Case, whose paper detailing this whole principle, with illustrations, was published in the *Proceedings of the Columbian Dental Congress of 1893*, and earlier in the *Dental Review*, seven or eight years before the publication of his book. I wished also to apologize publicly—if I found that apology was due—for my seeming attempt to steal someone's else thunder, by publishing for the last ten years in various papers read at prominent societies a certain scheme in regulating, as my own, which I now find may be original with you.

Having no doubt at the time that Dr. Angle's statement in a text-book was based on legitimate data, I wrote you for the date, etc., of the *first* publication of your method, naturally thinking you would remember it more readily than Dr. Angle. Was there anything so very strange in this, or contrary to civil or professional ethics, that I should not receive a civil and direct reply, if such data existed?

I wish to say in this connection, that I have never prized the claims which so many seem to value—even to dishonesty—that they were the *first* to use or practice any particular method. And furthermore, it is impossible for any man to say that others have not, even before he were born, used or practiced in some form the same principles he now thinks original with himself. You can therefore see the importance I place upon your statement that you are willing to take your oath that the said method is original with you. But why take your oath, Doctor, when you can easily show where and when you published it?—for do you not say in your letter: "If any man has used them [the method] before me, and obtained the effectual results that I have, and not informed the profession, he has not done his duty by it?"

That, Doctor, is just the position I take. The man—or men, for their name is legion—

who claims to have practiced a method long before someone else has published it as original with him, for the benefit of his brothers and humanity, deserves little or no credit. In our fast progressing profession, especially, honor belongs to those who freely give ideas for the upbuilding of our practice, and not to those who cover them under a bushel for their own personal ends. Besides, Doctor, you have been made painfully aware—I can see by your letter—as have many others, that no sooner does an originator publish his method, than there are any number of men ready to claim that they have practiced the same things for years. Then, will you tell me what there is to protect originators if it is not in the priority of their publications; and especially when an author of a dental text-book gives the credit of the origination of a certain method to one man solely because he happens to tell him in private conversation that he has used it for years—and at the same time ignores the fact that the same method has been prominently and repeatedly published by another claimant for seven or eight years before the publication of his book?

Now I do not say that you did not publish it long before I did—and if this is so, as I said before, I shall be only too glad to give you the whole honor of priority of origination—but I do say that there is every indication to show that Dr. Angle did not know of your *publication*, else he would have given its place and date in his book, especially as the method is considered so important as to lead him to adopt it as one of the principal features of his system. One of the principal indications, to my mind, that he did not know, is the reply recently received to a letter which I wrote him, asking for the dates of your publications upon which he based his authority for giving you credit, etc., that I might look them up. He was unable to say where you first published the idea, but that he saw a patient in your office, now grown up, for whom you had regulated teeth in this way when a child, and consequently he *believed* you had practiced the method for ten or fifteen years; and upon this, and this alone, he bases his authority to give you the sole credit and ignore the legitimately published work of another; and that, too, when during all these years these claims remained unchallenged, although he, if not you, must have known of them. How long does it take a youth for whom we could apply this method to "grow up"?

Under separate cover I send you reprints of a few papers which I have presented at prominent dental societies. You will see that the method in question, fully described and

illustrated, was presented at the Columbian Dental Congress of 1893, and earlier at the Chicago Dental Society. It would not be difficult for me to prove that I practiced this method years before I adopted its use as an auxiliary to my contouring apparatus in 1892; but I shall stand only on the dates of my publications, *and shall ask you to do the same.*

Now that I have responded to your request, kindly fulfill your promise and send me a reprint or the date and place of your first publication, that I may give you full credit in my book.

Yours truly,

C. S. CASE.

Receiving no reply to the above, I again wrote him (April 1, 1903), calling his attention to his agreement to furnish me with the data I desired, etc. He replied (April 9th) that owing to the illness of his wife he had been unable to attend to the matter, but now that she was improving he would do so as soon as possible.

Since that time (except the one of recent date which I publish below) I have received no communication from him whatever, notwithstanding the fact that I have written him four letters—May 18, July 17, October 13, 1903, and January 8, 1904, saying everything that a gentleman could to get him to either send me the published data of his claims, or an acknowledgment that there were none.

In my last letter, after telling him that I was about to publish the present article in the *Cosmos*, I say, "If you will kindly send me any paper or article of yours upon this method, that has been published heretofore, it will receive proper recognition; and if any of these publications appeared prior to 1893 I shall be pleased to accord the honor to you of originating this method of regulating teeth. Please to remember that it is now over one year and three months that I have been trying to obtain this data of your claim."

Quite to my surprise he at last replied to this, and as it consistently completes to date this very trying correspondence, I give it, with the final reply, in full:

BOSTON, MASS., January 28, 1904.

Dr. C. S. CASE.

Dear Doctor,—Yours of the 8th instant is at hand. I should have given your letter prompt attention, but as I have had a very important matter on my mind, for that reason my correspondence has been sadly neglected. In a few days, however, I hope to make a statement to you which I trust will be satisfactory as to the origin of what Dr. Angle terms the "Baker anchorage."

Very truly yours,

HENRY A. BAKER.

CHICAGO, February 2, 1904.

Dr. HENRY A. BAKER, Boston, Mass.

Dear Doctor,—In reply to yours of January 28th: Unless you mean, by "a statement" (which you now propose to send me), the locations and dates of your *published* papers upon the intermaxillary force, or an acknowledgment that there are no such publications in existence, it will receive no recognition from me whatever. Anything less than this is rightfully condemned by your own words to me in your letter of November 24, 1902, as follows: "If anyone has used them [the method] before me, and obtained the effectual results that I have, and not informed the profession, he has not done his duty by it." Again, in the same letter you say, "It is your place, if you have ever used this method and have brought it before societies or published it, to state your dates and send your publications, or . . . 'forever hold your peace.'"

Respectfully,

C. S. CASE.

DR. ANGLE'S ACKNOWLEDGMENT.

At the close of an article entitled "The Importance of the First Molars in their Relation to Orthodontia," by Dr. E. H. Angle, published in the *DENTAL COSMOS* for March 1903, may be found the following paragraph:

"Using the reciprocating force from rubber ligatures, engaging the opposite arches for the reduction of prominent incisors, was an idea given me by Dr. Henry A. Baker of Boston, but I have recently found that Dr. C. S. Case of Chicago made use of this plan of reciprocating force as early as 1893 (see *Transactions of the Columbian Dental Congress*). Which of these gentlemen was the first to use it, I know not; but be that as it may, I am certain that it is one of the most valuable additions to modern orthodontia."

Having all the facts at last before him, I leave my readers to draw their own conclusions as to the professional spirit and fairness of this acknowledgment.

USE AND MISUSE OF THE INTERMAXILLARY FORCE.

In the last ten years of my practice of orthopedic dentistry there has hardly been a time when from one to five of my patients have not been wearing the intermaxillary elastic bands above referred to, and I am pleased to say that I have no reason to change my opinion expressed in 1893 of the importance of this method, when properly applied in the regulation of teeth; moreover it is a great satisfaction to me to see that it is receiving a recognition somewhat equal to its merits. On the other hand, it is exceedingly annoying to me to see its frequent misapplication by those who seem unable to distinguish between an upper protrusion and a lower retrusion, and *vice versa*—and who, in consequence, apply it for the direct purpose in all cases of producing a reciprocating movement of both the upper and lower teeth. Again, it has been somewhat amusing to me to see the method lauded, as it has been in the past year or two—by those who do not seem to be in touch with the proceedings of prominent dental societies—as a recently discovered great principle of applying force that belongs exclusively to and forms one of the most important factors of the Angle system of regulating.

As a principle in itself for the regulation of teeth, and especially when attempts are made for considerable movement of buccal teeth for the correction of occlusion, I must say that its value in certain quarters is greatly overestimated. And I prophesy that if these enthusiastic operators continue to attach rubber bands of the heft recommended, to single first-molar anchorages, it will not be long before they equally underestimate the true value of this principle of applying force.

As an auxiliary force in a properly

constructed apparatus for retruding or protruding the teeth, and as an aid to the occipital force of a headgear apparatus, its value cannot well be overestimated. Therefore with the exception of those cases when a protrusion or retrusion of the teeth requires a reciprocating movement of opposing teeth, I rarely use it other than as an auxiliary to other forces.

For the protrusion or retrusion of the teeth of one jaw, as explained in my early papers, the force of the reaction should be distributed, through the medium of the apparatus, to the teeth of the opposing jaw so as to avoid movement. If retrusion of the teeth of one jaw be required, the hooks for the attachment of the elastics to the opposing jaw should be placed at the disto-buccal extremity of a stationary anchorage (constructed by uniting two or three bands firmly together in one piece), and at points near to the occlusal plane, in order to reduce the extruding tendency of the force when the jaws are opened.

The extruding action is one of the main objections to this principle of applying force, and certainly one that must limit its application, especially when attached to single molar anchorages—particularly the first molars as is commonly advocated.

ITS USE AND APPLICATION IN ABNORMAL PROTRUSIONS.

Fig. 3 shows a common method of applying the intermaxillary force as an auxiliary, in an apparatus for retruding the upper labial teeth where the first bicuspid have been extracted. The hooks for the attachment of the elastics to the upper are soldered to short tubes which slide back along the retruding bow and engage with the open tube attachments of the canines. I have used this form of hook for the intermaxillary force for the last six years. There is no patent on it, so that all are free to construct and use it. For other reasons also I believe it to be far superior to the form of hook devised by Dr. Angle. To prevent

rotation of the canines, hooks are soldered to the lingual surfaces of the upper anchorages and canine bands for the attachment of rubber ligatures. Lingual traction bars can also be used for this purpose, as shown in apparatus 70, in Fig. 5. By this arrangement the intermaxillary and upper anchorage forces are employed for the distal movement of the canines, while the occipital and upper anchorages are devoted to the retrusion of the incisors.

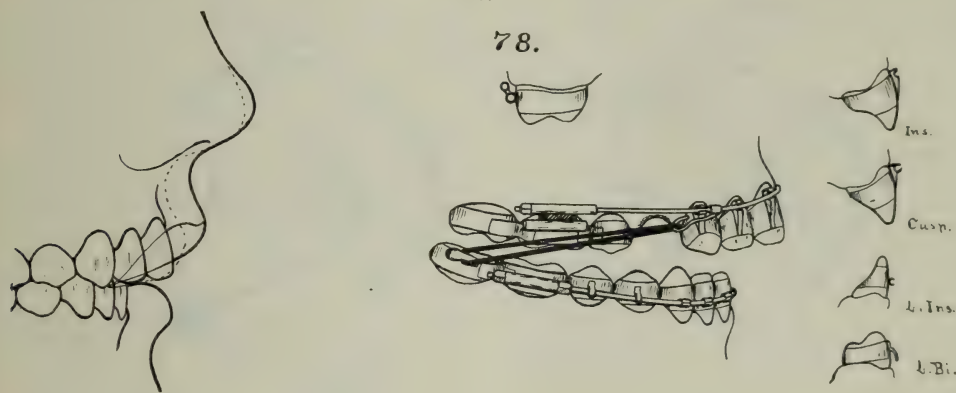
If under any conditions it seems advisable to combine the three forces for retruding the labial teeth in phalanx, the intermaxillary hook-tubes are soft-

upper teeth one-third or one-half the width of a bicuspid—it may be advisable to direct all possible forces first to the distal movement of the molars, especially after the eruption of the second molar. See "variation" in apparatus 70, and the application of the headgear bow especially designed for this purpose.

THE OCCIPITAL FORCE.

In nearly all cases with which the intermaxillary force can be used, the occipital force is also applicable—as mentioned in my early papers. As this is the principal force with which the inter-

FIG. 3.



soldered to the dental retruding bow, at points to engage with the canine attachments.

In cases where the protrusion is not sufficient to demand extraction—correction* being possible by retruding all the

maxillary force is an important auxiliary, it will be necessary for me to refer briefly to some of the advanced methods of applying force through the medium of the headgear apparatus, in order to fully appreciate the importance of the auxiliary.

A headgear apparatus should be one that can be worn with the least possible production of discomfort. One of its most important requirements should consist in possibilities of adjustment, so that it can be perfectly fitted to the individual case; to lie smoothly on the surfaces of the head and face, with no pro-

* When I or any other competent teacher of orthodontia speaks of "correction" in relation to the treatment of irregularities of the teeth (though we may not always succeed in accomplishing the full object of our designs), it is and always has been considered as an indispensable part of correction that the teeth should be brought to a good masticating occlusion, with cusps that interdigitate, though it may not always be a typically normal occlusion, at the expense of a facial deformity.

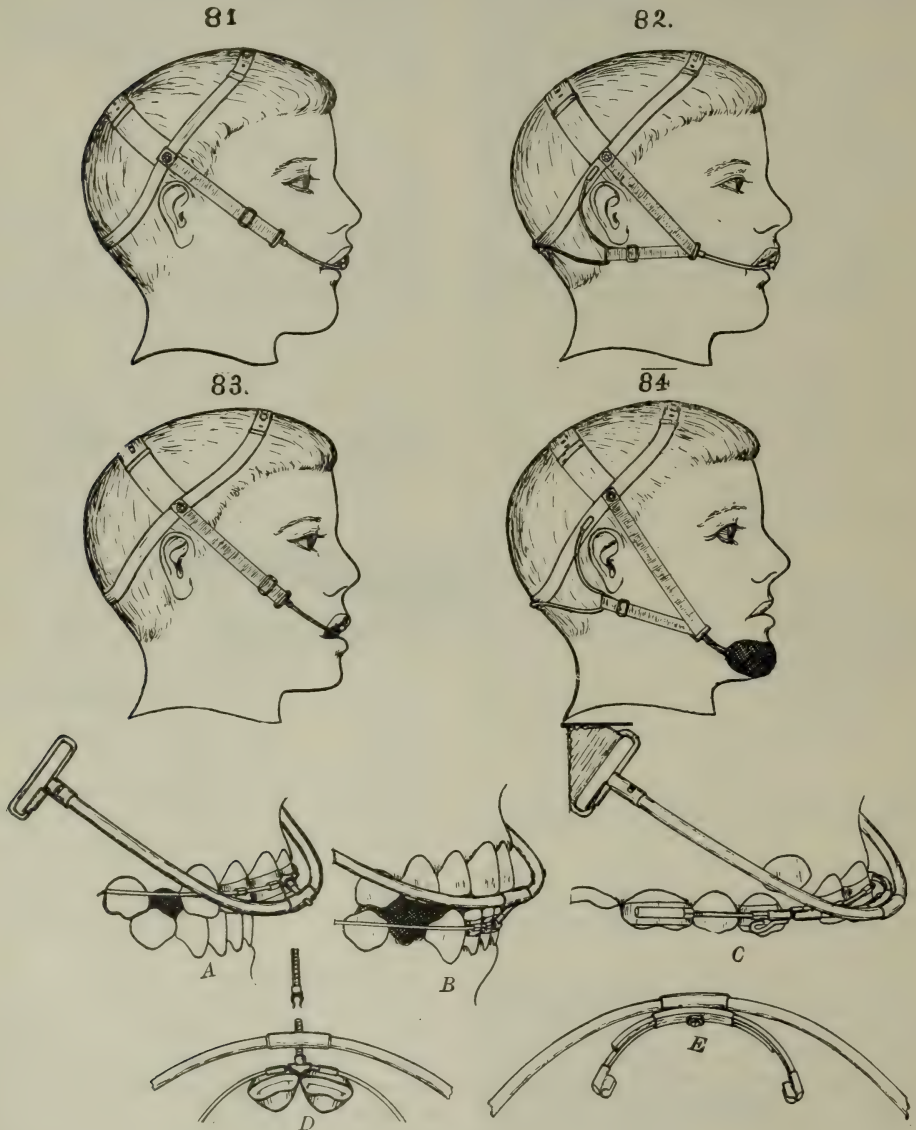
I speak of this here because I and other experienced orthodontists have of late years been accused of "relegating this important principle to the background, as of no im-

portance whatever." However, these expressions, I am pleased to say, have commonly emanated from young men of limited experience and seeming lack of knowledge of dental literature.

jecting portions or prominences to produce uneven and annoying if not painful

Fig. 4), the headpiece is composed of thin metallic ribbons provided with slid-

FIG. 4.



pressure of the tissues while the head is at rest upon the pillow; and one, moreover, that will enable the patient or attendant to *gradually* increase or diminish the force.

In that shown by the illustrations (see

ing gear and shaped to fit the head with a proper distribution of force.*

* The illustrations in this article are taken from a forthcoming text-book by the author, to be entitled "Technics and Principles of Orthopedic Dentistry."

The pieces are attached at the sides with a glove-fastener attachment permitting pivotal movement, and to which the silk elastics are buttoned. These are provided with sliding buckles to regulate the amount of force, and join the headgear retruding bow by means of swivel attachments, which causes them always to lie flat against the cheeks.

A and *D* in Fig. 4 show one form of the headgear bow, the principal and very important feature of which is that the threaded post-rest, shown detached in *D*, permits of adjusting the position of the bow to comfortable relations with the lips. Its means of engagement with the dental retruding bow is perfect, and with all necessary movements.

B shows headgear bow for lower teeth. In apparatus 96, in Fig. 7, is shown the combination in detail, which will be more fully described later.

C and *E* show the most advanced method for retruding any or all of the buccal teeth, by a direct application of force from the headgear apparatus—the applicability and importance of which should mark an era in orthodontia.

The bow-rest is provided with an adjusting screw for regulating its length and the position of the headgear bow in relation to the points of engagement.

In *C* the retruding force is directed upon the bicuspid attachment through the medium of the intermaxillary sliding hooks, and without producing the slightest retruding force on the incisors. In fact the incisors can be protruded at the same time by the dental bow from the molar anchorages, and in proportion to the demand for this movement the molars are retruded with the reaction of the force.

It will be seen that this arrangement comprises an important and effective combination of forces—occipital, intermaxillary, and anchorage reaction—united in their action toward a distal movement of any or all of the upper buccal teeth. Apparatus 70, in Fig. 5, shows the combination in detail.

In the “variation” on the right of this group of drawings in Fig. 5 is seen how the occipital and intermaxillary forces

can be *directly* applied to the molars through the medium of the intervening sliding tube on the dental bow. By placing a nut between the sliding and anchorage tubes the incisors can at the same time be protruded, and the reaction of this force will proportionately aid in the distal movement of the molar.

If desired, the occipital and intermaxillary force can be directly applied to a molar on one side of the mouth and the bicuspid or canines upon the other with equal facility. In fact, in an apparatus now worn by the wife of a Chicago dentist all of the occipital force is successfully directed to the distal movement of a single upper right molar. This is accomplished by using one-half of the bow-rest with the pivotal point properly adjusted to one side of the center of the headgear bow.

By the combination in its various details which I have briefly referred to, it will be seen that any or all of the buccal teeth can be made to receive the direct application of the occipital and intermaxillary retruding forces, which must appeal especially to those dentists who appreciate “the importance of correcting occlusion for retention on the principle of extension for prevention in the operative field.”

In various papers presented in the last ten years, I have endeavored to enforce the importance of this movement for the correction of malocclusion; principally in those cases where the buccal teeth have been permitted to drift forward by the premature extraction of deciduous teeth, with the frequent production of that common irregularity that is characterized by the mal-eruption of the canines.

“In the early methods of enlarging the dental arch by the use of plates, etc., and even with some modern appliances, the arches were expanded laterally, with little or no thought to the possibility of the far more important distal movement of the bicuspid and molars which is frequently demanded to restore them to the position from which they drifted, and which nature intended they should occupy to prevent the front teeth from

THE USE AND APPLICATION OF THE INTERMAXILLARY FORCE IN CLOSE-BITE MALOCCLUSIONS.

In times past, one of the most difficult upper protrusions to correct was that characterized by a close-bite occlusion—the lower incisors striking the gum back of the upper teeth, and sometimes back of the alveolar ridge. Any attempt to retrude the upper incisors in this position would tend to drive the lower incisor bite farther into the gum.

Early in the "90's" I introduced the method for first opening the bite preliminary to the operation proper—shown in apparatus 79, in Fig. 6—which I believe has been quite universally and successfully adopted. To crowns cemented to the first lower molars were attached buccal tubes in which rested the ends of a resilient dental bow, which passed under hooks on the bicuspid and over hooks on the incisors. This apparatus will lift the bicuspid to the new occlusal plane determined by the height of the crowns, and to a certain extent intrude the incisors; while the second molars, being young teeth, will soon grow to occlusion. After the position of the partially extruded teeth have become fixed, the crowns are removed and the first molars allowed to grow to occlusion.

Apparatus 80, in Fig. 6, shows an improved method by which the occipital and intermaxillary forces are important and effective auxiliaries. Here the bite is not first opened with the crowns, as formerly; extrusion of the molars—lower and upper—is accomplished with rubber bands which can be attached to pass directly from one to the other anchorage.

The lower bicuspid and incisors are extruded and intruded, respectively, with the resilient bow as before, the molar tubes being attached to bands instead of crowns, while the upper incisors are intruded in the process of retrusion with the occipital force.

ITS USE AND APPLICATION IN OPEN-BITE MALOCCLUSIONS.

In the opposite irregularity, or that of the open-bite occlusion, where the back

teeth and at times only the molars occlude, the slightest extrusion of occluding teeth would tend to increase the abnormality. In these cases, therefore, I rarely attempt to use the intermaxillary force except in rare instances, and then with a careful observation of every condition calculated to prevent the extrusion of the anchorage teeth.

In nearly, if not quite, all malocclusions of this character, the patients are or have been mouth-breathers, during the early years of development, sleeping at night often with the jaws gaped widely apart. If this position of the jaws be not corrected the intermaxillary force should not be applied, however apparently stable the anchorages. On the other hand, in those rare cases where it is possible to keep the jaws closed by other auxiliaries so that the line of force approaches a parallel to the occlusal plane, it will be found very useful.

In one of the rare cases where the practice is especially applicable, the open-bite malocclusion is characterized by a prognathous lower jaw—which, as it happens, was the character of the first case I published to illustrate this form of force. In its early application in these cases I used as an auxiliary, to keep the jaw closed, the occipital force through the medium of a chinpiece, attaching the elastics as far forward upon the head as possible, so that the line of this force would approach a right angle to the plane of the lower jaw.

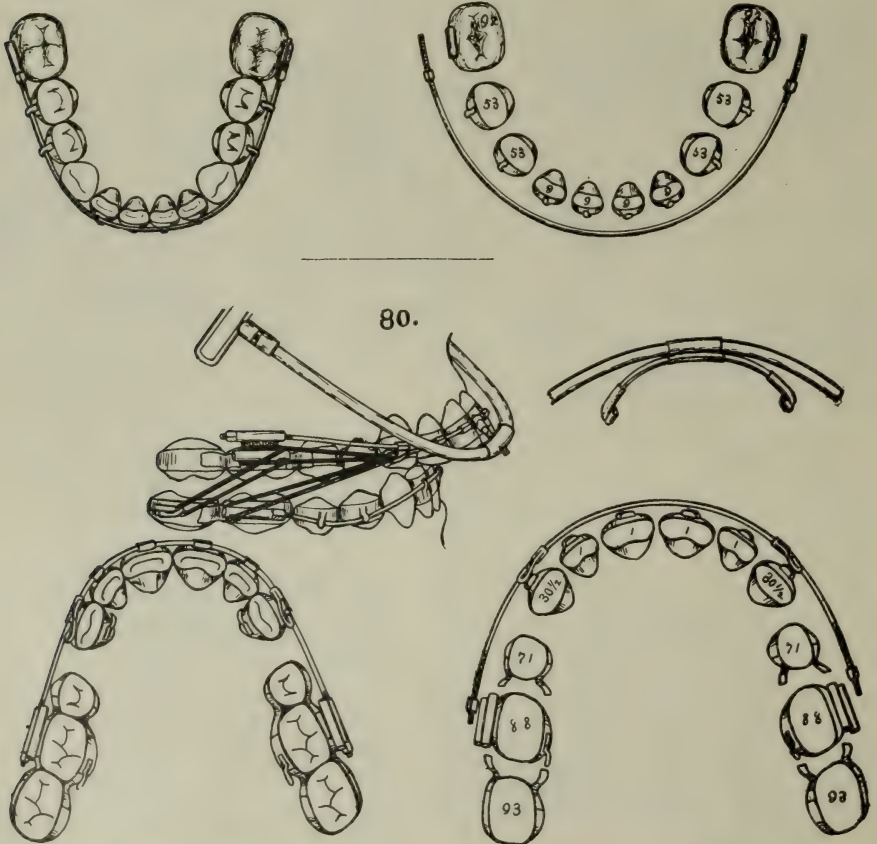
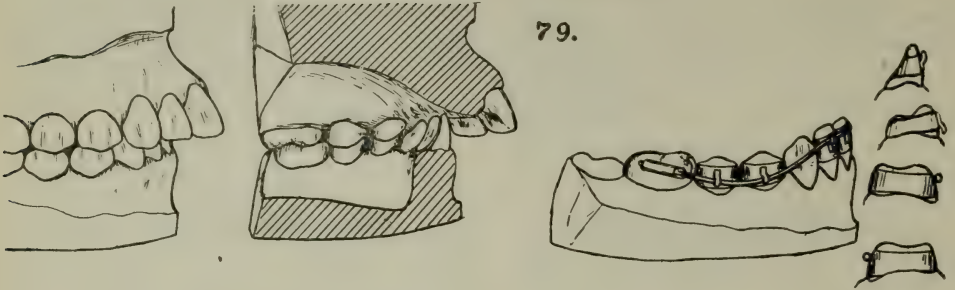
In apparatus 96, in Fig. 7, is shown an improved method. The headgear lower retruding bow is especially designed, and will be found eminently effective, for all cases of this character of malocclusion, where a retrusion and extrusion of the lower front teeth is demanded; and as it also serves to keep the jaws closed, the intermaxillary retruding force as an auxiliary is applicable during its action, as shown in the drawing.

In all cases of open-bite malocclusion, when the front teeth of both jaws will admit of an extrusion movement, intermaxillary rubber ligatures will do effective work attached directly from one

front phalanx to the other, as described in my 1893 papers.

ciprocating influence can be utilized, as in the protrusion of the teeth of one jaw

FIG. 6.



THE USE AND ABUSE OF ITS RECIPROCATING VALUE.

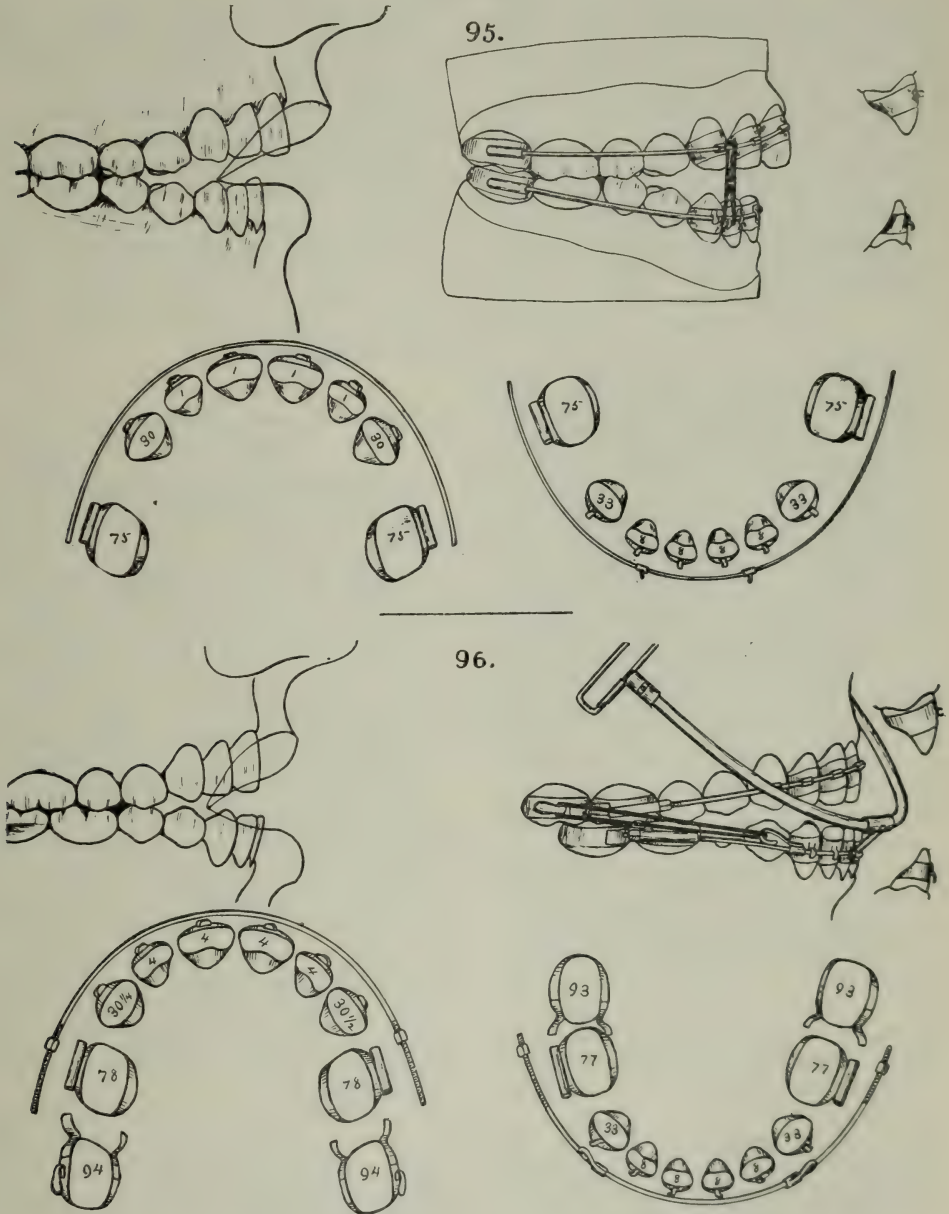
The intermaxillary force is especially applicable in all cases where its full re-

traction and the retrusion of the teeth of the other. As before mentioned, this seems to be the principal if not the only conception which some operators have of its

applicability; their efforts being mainly directed to obtaining a typically normal

normal relation of all the other teeth, accomplished without extraction.

FIG. 7.



disto-mesial occlusion of the upper and lower first molars, with the view of ultimately bringing about a typically

This is a most commendable object, and one to be eminently desired, but one which in the application of the inter-

maxillary force should be limited to those cases where a reciprocal movement of both the upper and lower teeth is demanded. And yet I suppose there are many who will continue to use blindly that which they understand as the "Baker anchorage" in every disto-mesial malocclusion of the molars, seemingly unconscious of the fact that in most of the cases they are either protruding or retruding teeth of one jaw that are already in an esthetically normal relation to the features of the physiognomy, with a final and inevitable production of a composite abnormality which, if correctly defined, must be a partial protrusion or a partial retrusion of teeth of both jaws.

Therefore in this connection I wish to protest against the above practice and misuse of the intermaxillary force; and, notwithstanding the teaching which has recently come from eminent quarters, I unhesitatingly here advise the extraction of bicuspid from an overcrowded arch in all cases of inherited excessive protrusions; and especially in protrusions of the upper where the lower teeth and jaws are in harmonious relations. Moreover, I cannot see the advantage in a considerable and very questionable bodily distal movement of molar teeth that are in a natural position in the jaw, or that have not moved forward to an unnatural position through the influence of dental or artificial forces—unless the operation contemplates the ultimate extraction of the third molars, which are often quite as important in the dental economy as the first or second bicuspid, if the spaces be permanently closed; and to say that the correction of an inherited upper protrusion of a crowded arch will be retained solely through the influence of the interdiggitation of the bicuspid and molar cusps is not true.

"In a large proportion of cases and especially those in the simple and complex groups, the relative size and relation of the jawbones are in perfect harmony with the stage of development, or sufficiently so as to make the rule imperative that we strive to produce a typically normal occlusion—an attainment

that is impossible where teeth are extracted merely to simplify the operation or under a mistaken impression that regulation cannot be otherwise accomplished.

"This does not mean that the principal and only object in practice is to attain to the production of a typically normal occlusion at the expense of producing or retaining a facial deformity, and especially when by the extraction of the first or second bicuspid we can place the operation within sure and easy possibilities of correcting the facial deformity, and leave the patient with a good masticating occlusion—often so perfect that only an expert is able to discover that teeth are missing."

ITS USE AND APPLICATION IN ABNORMAL RETRUSIONS.

The intermaxillary force is especially applicable as an auxiliary in the operation of protruding all the teeth of the lower jaw in order to correct malocclusion and restore facial relations. In its application, whether in reciprocation to a retruding movement of the upper teeth or not, great care should be exercised to prevent the extrusion of the molars—unless this movement be particularly demanded, as in close-bite malocclusions.

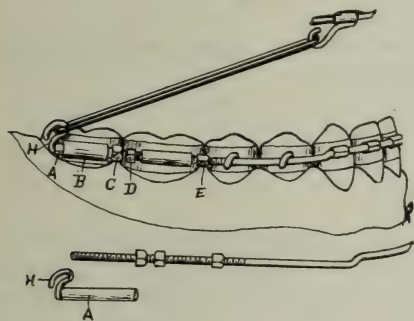
As most of the cases for which we are called upon to undertake these operations have erupted the second molar teeth, these should always, where possible, be included in the apparatus—not alone to reinforce the stability of the anchorages, but also for the important purpose of placing the attachments of the rubber bands at the most distal points in the mouth in order to keep the force in a horizontal or mesial direction as much as possible.

To further prevent the extruding tendency of the intermaxillary force, the molar attachment should be anchored down, so to speak, and in a way not to materially interfere with the protruding movement which we have in view.

In Fig. 8, the dental bow (No. 18 or 16, extra hard) engages with the labial teeth by means of the open-tube attach-

ments, and passes under the buccal hooks on the bicuspid, and then through No. 18 tubes on the first molars; the threaded ends finally resting in telescope or sliding tubes A, within the anchor tubes B on the second molars. These tubes have thin walls (No. 32). To one end of A, which is about one-tenth of an inch the longer, is soldered a hook, H, as shown, for the attachment of the rubber bands. The ends of the bow are threaded to carry nuts C, D, and E, placed as shown. When the apparatus is in position, the nuts C and D are turned back against the sliding

FIG. 8.



tube A, forcing it back until the hook H stands free from the distal end of the anchorage tube B, so that no forward pull is exerted upon the molars when the intermaxillary ligatures are attached. The force being directed wholly upon the bow through the medium of the tube A engaging directly with the nut C, the labial teeth alone to which the bow is attached are forced forward.

As the sliding tubes are forced forward, the hooks H are prevented from coming in contact with the tubes B, by means of the nuts C, which are turned back from time to time as the movement progresses.

When the labial teeth have been sufficiently protruded, the bicuspid are brought forward with rubber bands, wire or silk ligatures, attached to their buccal hooks and extended from one side to the other around in front of the labial teeth. During this movement it is well to keep the nuts C and E pressing against the

tubes, in order to add the anchorage force to that of the intermaxillary. In fact, at any time the two forces can be used in conjunction.

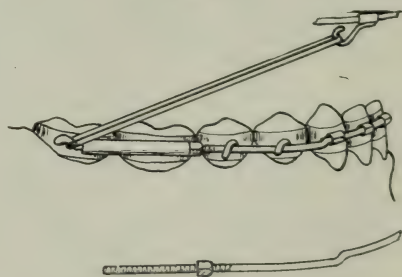
When the bicuspid position is corrected, the intermaxillary force is directed to the mesial movement of the first molars by turning the nut D forward against the distal end of the first molar tube and the nut C, as before.

Finally the second molars are brought forward with the intermaxillary force, by turning the nut C forward until the hook H attached to the sliding tube A engages with the distal end of the anchorage tube B.

From this lengthy description many will doubtless think this is quite a complicated operation. Yet the construction of the apparatus requires no more skill—if one be supplied with the proper material—than others that appear far more simple; and when accurately fitted and in position, from the fact that it contains in itself all the elements of complete and successful movements, the subsequent adjusting treatments are reduced to the minimum of time and difficulties.

The combination possesses many important qualities: First, the horizontal direction of the force, together with the

FIG. 9.



rigid quality of the bow, held down by its engagements to all the buccal teeth and yet permitting a distal movement along its surface, increases the stability of the anchorage against the extruding tendency of the intermaxillary force when the mouth is opened; again, the possibility of applying all the force to a few teeth at a time, and means being

provided for holding the positions gained while others are forced forward, is a great advantage.

A variation in the molar appliances of this apparatus is shown, in Fig. 9, which will commend itself because of its greater simplicity and ease of construction and attachment, especially where the second molars are short or are not fully erupted. To the buccal surfaces of two band stationary anchorages are soldered tubes for the threaded ends of a No. 18 protruding bow, applied as shown. Into the extreme distal ends of the tubes are sol-

dered short wires which are bent to form hooks for the intermaxillary rubber bands, the force of which is used at first as an auxiliary to reinforce the stability of the anchorages. When the labial teeth and bicuspid are sufficiently protruded as before, the anchorages are replaced with separated molar bands with buccal tubes and with two nuts between the tubes for the mesial movement of the first molars; after which, by unscrewing the distal nuts the second molars are brought forward, as before, with the intermaxillary force alone.

THE USE OF PORCELAIN IN DENTISTRY AS APPLIED TO THE CONTINUOUS GUM.

By D. O. M. LE CRON, D.D.S., St. Louis, Mo.

THE origin of porcelain is lost in the mist of ages, partially baked utensils formed of earthy materials being found with the stone implements of prehistoric times. It is more than probable that it was anterior to the discovery of hardening by fire, as sufficiently useful vessels can be sun-baked, and are so made to this day in Egypt and India. Prehistoric man must have observed the property of plastic clay to retain the water in the holes made by his feet, and must have conceived the idea that articles might be shaped from it more suited to his wants than animal skins or roughly hollowed wood or stones. It is universally admitted that it is one of the most ancient of inventions, and probably was only preceded by the manufacture of arms, which would have been the first requirement of man for purposes of self-defence.

The two things from which we are able to prove the history of past ages are fossils and pottery, and in the latter are written the history of peoples and the progress and development of civilization, and it is for this reason that men, whatever may be their studies or occu-

pation, all take more or less interest in this art. Though difficult to discover its absolute origin, it is easier to decide to whom is due the honor of producing good qualities of porcelain. This distinction we must assign to the Chinese and the Egyptians, as they both gave evidences of their skill at least 2000 years B. C.

The United States can boast of its ceramic history. It can be shown that the fictile art is almost as ancient in this country as in Europe. The aboriginal tribes of North America practiced the art ere Columbus' time. The nomadic tribes which were found in possession of the country by the first white settlers along the eastern coast had scarcely progressed beyond the first stages of savagery. Their implements were fashioned from stone, and their utensils consisted of rude steatite pots, mortars dug out of rough boulders, and a few earthen vessels. These latter were molded by hand from coarse clay intermixed with sand and broken shells. Being imperfectly baked, and consequently of an extremely friable nature, they were easily destroyed. Few entire examples of their handiwork in clay have descended to us.

Broken fragments, however, are plentiful among the débris of abandoned camps, and these serve to show the shapes of vessels, and give us an idea of the primitive style of ornamentation employed in their manufacture.

The mounds of our great Mississippi Valley and the stone graves of Tennessee have yielded an abundance of pottery of a finer quality, and farther west an entirely different character is met with in the ceramic ware made by the ancient house-building races and still produced by their modern descendants, the Pueblo, Zuñi, and Moqui Indians of New Mexico and Arizona. Throughout the ancient ruins of this section, sherds and vessels in all stages of entirety are found in astonishing abundance.

More skill is required in the production of porcelain than in the manufacture of articles from such materials as horn, wood, or stone, which require no after-processes to render them serviceable. And though clay is more easily manipulated during the early stages of its manufacture, it is more difficult to bring it to a satisfactory conclusion, owing to the firing processes which it has to undergo.

I wish to call your attention to the wonderful action upon clay of *heat*, which has enabled vessels of so fragile a substance that it can easily be broken to pieces in the hands, to endure for thousands of years and to be hardly affected by atmospheric changes and direct contact with the damp soil; while coins and arms under similar conditions have deteriorated considerably from their original state. So that, as Sandeman says, "A piece of common porcelain is more enduring than epitaphs in brass and effigies in bronze. Stones crumble away, ink fades, and paper decays, but the earthen vase survives the changes of time and conveys its message from long-past ages."

Many of our historic records are found recorded on porcelain. The Phœnicians utilized it in making imperishable records that have been handed down to us. So we find, tracing ancient and medieval history, that the art of making porce-

lain was practiced many, many years ago, and our modern manufacturers are but imitators!

The composition of porcelain is frequently guarded as a trade secret, but of late years with only indifferent success. The materials available in each locality, which form the basis of manufacturing, differ in their chemical elements, and even when the exact composition is known it cannot be reproduced by merely bringing together, in correct proportions, the right chemical elements. To use the different materials direct experiments with them must be made from the start, and as the substances extracted from the earth vary from year to year, these experiments must be repeated subsequently in order to maintain the quality of the product.

In the presence of modern chemical analysis and microscopical research it avails little to keep secret the composition. Analysis reveals the proportion of the primary elements; the microscope goes far to determine the mode of grouping.

The history of porcelain in dentistry had its origin about 1815, when some energetic Frenchman commenced the manufacture of artificial teeth—unfortunately of very inferior quality as to strength and color. This incentive prompted others to follow, and success and failure followed, until we have succeeded in accomplishing the desired results.

The use of practical porcelain work in dentistry dates from 1846, when Dr. John Allen began the baking of continuous-gum work. From that time a few enthusiastic men have kept incessantly at the development of this branch of dentistry. The reason why it has been slow in its development, apparently, is that it requires more skill in its manipulation than is called for in the ordinary dental operations. A failure in any part of the process usually ends in failure of the whole.

The pioneers had the old coke furnace to contend with, which requires so much time to get the required heat, compared with our modern electric furnaces. They

also had to compound their own porcelain body, composed of kaolin, feldspar, silex, calcined borax, and caustic potassa. To produce the gum enamel they would use English rose. And how many of our profession today, I would ask, would undertake such propositions! When we consider, though, that they used only the pure metals for bases in constructing the plate, they were compensated for their work accordingly, and the great appreciation of their mechanical and artistic skill should be considered. I am sure many of us would throw up our hands and cry "Oh, joy!" if we could dethrone the *cheap* base vulcanite, which has done more to degrade the prosthetic department of the dental profession than all other causes combined.

The porcelain plate is worthy of better associations; it delights the eye and gives evidence of high esthetic cultivation, and it adds to beauty the charm of usefulness.

PORCELAIN IN CONTINUOUS-GUM WORK.

In continuous-gum work platinum is used as the base, and I assure you the underlying tissues are always found in a more normal condition than with the use of any other base for a plate. The method of constructing this artistic denture is old, and is no doubt familiar to many of you in theory at least.

The first step is a perfect impression and model of same in plaster of Paris, then we proceed to make the die and counter-die. The dimensions of the required platinum base for the denture can be obtained from the plaster model with tin foil or sheet lead as a pattern. The plate for a full denture should be made sufficiently large in its dimensions to cover all the hard palate, the alveolar ridge, and all portions of the external borders of the latter not encroached upon by the muscles and reflected portions of the mucous membrane of the lips and cheeks.

There is quite a diversity of opinion in regard to the thickness of platinum; some advise No. 24 gage, and believe that the strength depends largely on the platinum base, while others advocate 28

to 32 gage—believing that the porcelain has enough strength to maintain its integrity. The writer has used all gages up to No. 36, and contends that 34 to 36 gage properly reinforced is sufficient, making it more rigid and less bulky. The heel of the plate should be reinforced with iridio-platinum plate of No. 24 gage one-eighth of an inch wide extending to the wire of the rim, soldered with platinum solder. The anterior central portion is reinforced with a V-shaped piece of iridio-platinum extending from the ridge back on the palatal surface. With the above reinforcement one has the advantage of strength, lightness of plate, less expense for platinum, and can better manipulate the porcelain.

The plate being swaged in the usual manner and reinforced, the rim may be turned over, or a No. 18 gage platinum wire soldered thereon. In whatever way the rim is formed, it is very important that the exact dimensions of the plate should be ascertained, as it will be impossible to subsequently diminish the extent of the borders without to some extent impairing the integrity of the finished work.

The mouth should be carefully examined and the precise location and fullness of the muscles and hard palate carefully noted and accurately traced upon the plaster model, as a guide in determining the dimensions of the plate. After being satisfied that the plate is perfectly adapted to all parts of the mouth, the bite is taken in the usual manner and is secured on the articulator; the next step is the arrangement of the teeth—known as "continuous-gum" teeth, being special teeth made for this purpose. These are arranged and united firmly with wax on the palatal side of the plate when perfect occlusion is assured. The roots of the teeth should come in contact with the plate if their length be sufficient; otherwise we are obliged to support the tooth with bits of broken teeth, on account of shrinkage of the porcelain in firing drawing them out of line.

Always aim to have two points of the continuous-gum tooth in contact with

the plate, the platinum pin and the porcelain root; you can then rest assured the teeth will not be misplaced by the shrinkage of the porcelain if proper separation be made in carving it, as I will explain later.

Invariably I place an iridio-platinum round wire on the ridge of the plate to which to attach the platinum pins of the teeth; frequently the absorption is so great that it is necessary, also the wire adds great strength to the plate. I advocate the use of round wire in place of a strip of platinum plate, which many advise, the porcelain fusing on it with less cracking and adapting itself more uniformly.

In placing the wire in proper position under the pins of the teeth, I usually take modeling compound and extend it around the teeth from heel to heel of the plate, adapting it to the rim of the plate and the plaster model, also extending the compound over the cutting edges and occlusal surface. The wax is removed, the pins of the teeth are raised, and the wire is adjusted and waxed to the plate. The teeth should then be removed *en masse* with the compound impression, and the wire soldered to the plate.

I will mention here: Never swage a plate after it is wired with die and counter-die, as it will imbed itself in the lead. Always use the shot swaging device.

The teeth are now returned to the plate, the pins bent down in contact with the wire or the base of the plate, and waxed securely in place; the compound is removed by dry heat, and we are now ready to invest the case for final soldering.

To make the investment small, uniform, and compact, take a piece of sheet wax, cut a strip that will be a quarter of an inch higher than the cutting edge of the teeth when resting on a glass slab; conform the strip of wax to the plate, allowing a quarter of an inch space outside the teeth for the investment to fill in; securing the formed wax to a glass slab with a hot spatula, proceed to make the investment by filling the form say

three-quarters full, and after covering the under surface of the plate, and filling around the roots of teeth with the investment, insert the piece down in the form to within one-sixteenth of an inch of the glass slab, forcing the investment up around the teeth, working the same over the cutting edge and occlusal surface one-sixteenth of an inch.

Of late years I have been using Brophy's investment material with good results, on account of no shrinkage, no checking, and its standing the unusual amount of heat required to solder with twenty-five per cent. platinum solder. Soldering twenty-five per cent. platinum solder with a large investment makes it necessary to have a compound blowpipe in which the ordinary illuminating gas flame is combined with a current of nitrous oxid; the combustion of the two gases forms a carbo-oxyhydrogen flame. A bit of solder having united each pin to the plate, the plate is allowed to cool. Remove the investment carefully, cleanse all parts, and the plate is ready for the *first* application of the porcelain.

Let me here say that, to be successful, great care and cleanliness must be observed; any foreign matter coming in contact with the porcelain will make the finished work correspondingly defective.

The porcelain is prepared on a glass slab, being thoroughly mixed to the proper consistence with distilled water, and is then applied on the palatal surface and around the necks of the teeth, the plate being jarred at intervals to bring the water to the surface; this is absorbed with blotting paper cut in strips for the purpose. Use as much pressure in absorbing the moisture as possible; by so doing you get a more compact layer of body, and consequently less shrinkage. When all parts are covered to the proper thickness, carve to represent the gum, roof, and rugæ of the mouth, taking care to keep the crowns of the teeth well defined.

We have now advanced so as to be ready for the firing process, as many writers would present it. There remains, however, one very important point for consideration—*shrinkage*. To have the

teeth stand in their respective positions it is absolutely necessary to make calculation for shrinkage in firing. There are three periods of contraction of porcelain:

First: When, as the water dries out of the mass, the solid particles move closer together, this continuing until they can make no farther progress toward each other.

Second: When the particles begin to combine by heat and some of the component parts commence to vitrify.

Third: From the point at which the particles begin to combine to that at which the highest degree of heat is reached and the component fusible parts become vitreous.

The principal causes of shrinkage may be said to be, first, the coming together of particles which previously were mechanically kept apart by the presence of water which has now been driven out; and secondly, the fusing of some of the component parts of the body. It is noticed that with the low-fusing bodies in firing the contraction is vertical, and then assumes the globular form, while the high-fusing porcelain stands as carved, contracting regularly to the mass, provided it be not attached to a platinum base, in which case provision must be made by separation of the mass, or the base will warp in contraction, or the body separate at the weakest points. I hope this is made clear so that you will comprehend the importance of making perfect separation in order to allow for shrinkage.

With all *large* pieces, where we have teeth or facings attached to a base we must make perfect separation between the same; so in a continuous-gum denture I make separation with a fine ribbon saw between each individual tooth, clear to the base of the plate. By so doing one can be assured that the teeth will stand as placed, and no warpage of the plate ensue.

The case is now ready for the first firing.

The plate should be placed in the furnace on the base upon which it was soldered, or better, an iridio-platinum wire bent in a V shape, with upturned end,

so adjusted as to support the plate. The heat is then gradually turned on, pushing the lever of the rheostat on the first button, allowing it to remain five minutes, and then likewise, at intervals of two or three minutes, on the following buttons, until the last button is reached; after this the case must be very closely watched.

To determine the correct fusing I use pure gold and a Seager cone as a guide. The first bake should present rather a frosty appearance, and its surface not be quite glazed. The plate is gradually cooled or annealed by allowing it to remain in the furnace until cool enough to handle. It will present a rough and fissured surface according to the separation and contraction of the porcelain.

The second layer of body is applied in the same manner as the first. The fissures should be filled in perfectly, and any contour that you deem necessary should be restored.

The case is now ready to return to the furnace for the second bake. The furnace is operated as before mentioned, except that the body is this time brought to a glaze. In the second baking of the body, care should be taken that it be not overdone; properly baked it will present a beautiful granulated appearance, the tips of the granules sparkling. Carrying the heat beyond the stage necessary to produce this effect vitrifies the body, greatly lessening the strength of the work.

The piece is now ready for enameling. The gum enamel is applied in the same manner as the body. The layer of enamel should be thin and somewhat irregular, the yellowish white of the body showing more or less through it, so as to give the variations of tint observed in the natural gum.

The greatest care should be observed, in applying the paste, to remove every particle from the parts of the teeth and plate which are not to be covered. The outlines of the necks of the teeth and rugæ should be well defined with small camel's-hair brushes and instruments designed for the purpose.

After the application of the gum

enamel the piece is again subjected to the heat of the furnace as described for baking the body. Much experience is necessary in order to determine the exact heat to develop the full beauty and strength of the plate. When the latter is finished it should present the smooth, glossy appearance which is required for the enamel. The enamel being thoroughly fused, the furnace should be allowed to cool gradually by inserting the stopper and allowing it to cool until the plate can be taken out with the hand.

The finishing process consists simply in smoothing and polishing the platinum part of the plate and rim.

In conclusion I wish to say that upon the carving of the first body largely de-

pends the artistic beauty of the work. "Keep your patient's face well before you in your mind's eye," and reproduce in porcelain all those little minor details which, when properly arranged and blended together, shall so counterfeit nature's handiwork that that of man can hardly be detected.

The perfection and completeness of results attained in the production of a continuous-gum denture—imitating so nearly the natural organs in all their more obvious physical and distinctive characteristics as to be almost, if not quite, indistinguishable from the latter, when applied in obedience to the esthetic requirements of individual cases—is one of the marvels of ceramic art.

THE VERTICAL HALF-CAP OR BRIDGE-WORK ANCHORAGE.

By A. G. BENNETT, D.D.S., Minneapolis, Minn.

HAVING received a number of inquiries respecting my experience with the bridge-work attachment that I gave to the profession about fifteen years ago, I have concluded to write an article on the subject which will at once answer any questions and at the same time substantiate my claims as the inventor of this device. And this article is made necessary, if not imperative, because Dr. Carmichael of Milwaukee claims to have secured a patent on the same invention at a much later date than those which I propose to substantiate by documentary evidence. The later or more recent claimant to this idea is reported to have said, when he was reminded of my priority respecting this invention, that my claims did not materialize. I reply that this can easily be shown to be a matter of record and information. I think it is safe to assume that anyone open to conviction will find sufficient testimony in the following facts to establish my claim to priority.

In the first place, the idea occurred to me when I was demonstrator at the Pennsylvania College of Dental Surgery, during the term of 1885-86; and it was first used in the clinics of that institution. There are many men who were students at that and the succeeding two or three terms who can testify on these points.

In the second place, after I had used this device about a year, I passed it around at one of the meetings of the Odontological Society of Pennsylvania. The clearest proof of this fact will be found in the records of a meeting held on Saturday evening, February 4, 1888, in Philadelphia. On page 126 of the published Transactions of that society, as well as in the DENTAL COSMOS, will be found the point in question, as follows: "I have a model here which I will pass around for the inspection of the members. It is a new attachment or anchorage for bridge work. It consists of a vertical half-cap, which incloses the in-

ner part of molars and bicuspid, and is retained in grooves on the approximal surfaces and between the cusps."

Up to that time I had been using this vertical half-cap mainly on molars and bicuspid, because I felt that I was there on firmer ground; but even before this I had had the case of Miss M., a patient sent me by one of the prominent Philadelphia dentists, for whom I used the half-cap on a canine, though the dentist himself had suggested that I "throw a band" around the same tooth.

In the third place, at a large clinic held at the Dental College in New York city under the auspices of the First District Dental Society, during the same year, I was present with a patient and demonstrated the use of the vertical half-cap in a bridge which extended from the left first bicuspid to the first or second molar.

I had also a model of an enlarged bicuspid showing the method that I then used in making the cap. Besides this, I had a detailed description showing my method of using it on the canines and incisors, including its application in teeth of all classes. A copy of this paper was handed to the secretary of the First District Dental Society, who had charge of the clinic on this occasion. The use of this device to retain fillings I discussed at the time with several well-known dentists. The model I mention is herewith illustrated. (Fig. 1.)

During the next two years—1889 and 1890—I modified and somewhat improved my method of making this device for posterior as well as anterior teeth; and during the same period I made a number of bridges, in the incisal as well as the bicuspid region, that were retained by this device. A record of these cases has been kept and is now in my possession.

During the last ten or twelve years I have used this device in many cases, a majority of which have been successful and satisfactory. I am free to admit that I have had, too, many failures—which are mainly due to an inherent defect in this system, a tendency to loosen at one end or the other, following which

the patient's delay or neglect may not infrequently ruin the tooth thus exposed to extensive decay.

THE VERTICAL HALF-CAP ATTACHMENT.

As I have already said, I have modified and improved my methods of making this attachment the same as has been done in almost any invention of this or of any kind. I do not claim that these improvements are in any sense essential parts of the original model; they are simply means of securing greater closeness of joints and consequently durability. I do not think that any of my improvements have added anything to the strength of these attachments.

FIG. 1.



Now as to the necessity of instructions in making this device. It has never occurred to me that any dentist who could properly prepare a cavity and make a gold crown would need anything more than a rough illustration to enable him to make this device more or less perfectly without demonstration or experience. The one striking characteristic of this device is its exceeding simplicity. All that is needed is the mere statement that the tooth is prepared by transforming the usual approximal cavities into grooves which, in the case of molars and bicuspid, are carried through between the cusps disto-mesially, and in all cases just to the gum margin; and then that portion of the tooth to be incased by the cap must be so reduced and paralleled and the inner cusps so shortened that when the cap is in place it will fit closely at the neck of the tooth and not interfere with the articulation. (Fig. 2.)

TECHNIQUE OF THE OPERATION.

According to my method of making these caps, they consist of two layers; the inner, consisting of pure gold, is

bent and packed and burnished into the grooves and against the tooth with an oval-faced plugger and an ordinary burnisher, and then removed in an impression; and the second layer, consisting of the usual crown gold, is carefully bent and burnished, with frequent annealing, on to the first layer, which is of course

Fig. 2.



on the model. These two layers are then united and strengthened by flowing 20-karat gold solder between them at the time the whole case is soldered. At first I put platino-iridium wire staples in the grooves and across between the cusps either before or after taking the impression; but I did not always find this necessary when the grooves were very shallow. It is, however, a good plan in the interest of strength to use such a staple in all cases. (Fig. 3.)

Fig. 3.



As will be seen, this kind of attachment demands accuracy in fitting and strength in constructing, for the obvious reason that the interstitial movement of the teeth, especially when long and inclined to loosen, almost precludes the use of such a device unless made in a careful and substantial manner. But the method of setting bridges held by these attachments is just as important as the mode of construction. In the first place I have never used a paralleling instrument in making the grooves, because, though this may be important in some cases, I have never found it necessary or desirable to have the gold fit the grooves too closely,

for the reason that there must be room for barbing the gold and undercutting or threading the groove. The layer of cement, of course, should be thin and must run to an edge at the margins of the cap. But the strength gained by undercutting and barbing is a great gain over a smooth, close fit. But in setting bridges retained in this way, thorough dryness—secured by alcohol and warm air—is equally important, and if possible, more imperative than barbs and undercuts.

INDICATIONS FOR ITS USE.

I have been asked why these bridges fail more frequently than those held by bands or crowns. Obviously this vertical half-cap can never be a strong attachment—at least not so strong as a band or crown; and for this reason I use it only on the front end, making the other more secure by a good strong band or full crown. Of course, on the front teeth it is not so liable to be loosened; but even here, when the canine is very short, I prefer to put on a band of the usual kind with the front cut out and with the narrow labial strip sometimes reinforced. I might add that preparing a front tooth so that it will retain this band most effectively is the same in principle as preparing a large, difficult approximal cavity, and consists essentially in dividing the strength of the operation between the tooth and the attachment.

And yet, in spite of the defects and limitations in this system, I have quite a number of cases, even on thin front teeth, that have been successful and very satisfactory, though even some of these require resetting about every three or four years. It may be justly claimed that resetting bridges thus often is a good thing either for the teeth they inclose or the gum surface they cover, or both. On the other hand, it must be admitted that many patients make little or no distinction between loosening and failure; and it is this class that must be reckoned with in all cases.

RIGGS' DISEASE—FROM THE STANDPOINT OF A SPECIALIST.

By **ROBIN B. ADAIR, D.D.S., Atlanta, Ga.**

BRAINS, time, and progress have changed everything in these later years. A hundred years ago all doctors knew everything about medicine; today there is no physician who pretends to have mastered either medicine or surgery. And in my imagination I can see when, at no distant date, specialism in medicine will increase in favor and knowledge, and that there will be a tendency for specialists to separate from the medical profession as a parent.

A few years ago the dental profession was despondent. One prominent dentist even went so far as to say, "We are bastards, wandering up and down the face of the earth, not knowing what we are, and no one to claim us." In those gloomy days we cried for the medical men to claim us as "specialists of medicine."

DENTISTRY A SPECIALTY OF MEDICINE.

A brighter day has appeared, and the hosts of dental specialists through their knowledge and skill have bridged over this threatening chasm between dentistry and the so-called parent, medicine, until dentistry is now recognized by all the leading medical organizations as a profound and philanthropic agent of the healing art.

This progress and advancement, you will notice, I have credited to dental specialists; and the sooner we begin to comprehend and appreciate the fact that dentistry could not be mastered in all its branches in a dozen years, and that most of our failures and shortcomings have been due to trying to do too much, the better it will be for the profession.

Your essayist would not for a moment be understood to mean that dentists should perfect themselves only in one

branch, and practice that exclusively. The rhinologist, the oculist, the aurist, all are fully qualified physicians, and no one would accuse them of being narrow-minded. The law recognizes the greater learning and skill of the specialist over those of the general practitioner. When a dentist announces to the public that he is a specialist in any branch, whether it be oral surgery or operative or prosthetic dentistry, the law requires him to exercise more knowledge than the "ordinary skill" of the general practitioner.

I realize that the general practitioner must ever be in the majority; but every man can make a special study of some part and assist in the advancement of dentistry. By the adoption of a specialty I do not mean that it need be followed exclusively; one may be taken up without interfering with a general practice.

The successful specialist must have expert knowledge on all branches. He must be a mechanic, electrician, physician, and surgeon, whether he has the M.D. degree or not. Really, when you come to think of it, dentists are specialists anyhow. They are human, and will have preferences for some particular branch. The college professors whom we hear debate so ably on certain subjects are the men who lecture all the year round on that particular subject, and who have perfected themselves in it. Some of you are known as fine bridge-workers, while others are rubber-workers, some are orthodontia experts, and some porcelain cranks; while some have made a reputation as oral surgeons and Riggs' disease specialists.

All branches of dentistry are important, but the field of specialism in Riggs' disease is most inviting, for the reason

that it is least explored; and the opportunity is given to such specialists to climb that ladder at the top of which lies human success, by the saving of numberless teeth which are now lost, in spite of the learning and skill of the general practitioner.

The citizens of any town are not long in finding out who is the best man for a special operation, and when they find out that Dr. — has made a specialty of this disease, and gives special attention to these cases, they are willing to pay him his own terms. About this time the old foggy around the corner and the competitor across the street have begun to lose some of their patients, and they dispose of the progressive specialist by saying that he is a "fake," and that "Riggs' disease can't be cured anyhow." And if they happen to see or hear of a case that maybe through personal neglect has relapsed, they grow hilarious over the fact, and are sure to tell every one of their patients that the "Riggs' fake has failed to cure Mrs. Jones," forgetting the fact that maybe there are hundreds of other successful cases to the specialist's credit. Now, we will say that our specialist is a man of learning, and is ethical. He is saving teeth that would have been lost had the advice of other dentists been followed, yet it is a sad fact that the specialist generally has to make his reputation before the public while being condemned by those of his profession who should encourage him.

If the dentist believes there is no cure, and will not perform the necessary operation, it is clearly his duty to refer such patients to someone who can and will benefit them, just as physicians refer their special cases to the oculist or other specialist. It is our professional duty to put aside any animosities and ascertain whether this *confrère* is benefiting humanity or not. Many patients whose troubles originally presented no difficulty, but—from having been operated on by a general practitioner not prepared or properly equipped for this special branch of work—have been the victims of much suffering, waste of time, and worry, have fallen

into my hands in a worse condition than before the treatment, and have been harder to cure than if they had never been operated on.

I quote from a recent paper by Dr. W. T. Reeves of Chicago on "Porcelain," but for the purpose of this essay the word porcelain is changed to Riggs' disease. Says Dr. Reeves, "Those persons who have heard enough about Riggs' disease to ask their dentist about it will sooner or later learn that the dentist's argument was a subterfuge behind which to hide his inability. You may judge what the outcome will be. Several such individuals have become patients of mine, and I don't think they are working very hard for the other dentist. No, gentlemen; be honest! If you cannot successfully perform a given operation in Riggs' disease, tell your patients so. Tell them that you have done very little in that line of work, and do not feel able to undertake this particular case. If you know of anyone who is making a specialty of Riggs' disease, tell them that Dr. B is doing more along that line than you are, and that he might be able to do it for them. Your patient will respect your honesty, and if they go to Dr. B for this particular operation they will still remain patients of yours for other work; but if you deceive them and they find it out, you will lose them, and their influence will be more than their loss." These words of Dr. Reeves are truer than most of us realize.

I wish to call your attention to the success of specialists in this branch, from Riggs, Atkinson, Younger, Mills, Miller, Talbot, Rhein, Peirce, Smith, Good, and others that time forbids me to mention.

Being a specialist myself, I plead guilty at once to egotism, and my only excuse is the teachings of twenty-five years of experience with my hobby—Riggs' disease. I have been through all the ups and downs of specialism, and believe I know what I am talking about.

I omit all discussion of the etiology of this disease, nor will I take your time to describe a condition that you all know, except to say that the specialist seldom gets the case in its incipency.

The operation that I shall presently describe is for the more advanced cases where there are loose teeth with deep pockets extending nearly to the maxillary nerve; a mass that is of a rotten cheesy nature, of disintegrated bone; gums swollen and having little adherence to the surrounding structures. I want to describe what I hope will be of interest to you—what I do with this condition; my method of operating and treatment.

METHOD OF OPERATING.

My armamentarium consists of about every instrument put on the market—most of them now discarded. Those I use are original, together with four or five modified instruments from the Allport and Younger sets. In all, about fifteen instruments, including engine burs, syringes, etc., are placed in my sterilizer before the patient is seated in the chair. Dentists are prone to slight the subject of sterilization, but here we have a serious operation, and complete asepsis both of the field of operation and the instruments is imperative. For the field of operation I use hydrogen dioxid full strength, followed with a mouth-wash the formula of which is given on page 374. These preparations are used in an atomizer under thirty pounds pressure.

I begin operating at some point where the disease has not progressed far, so as to get the patient under control. Each selected section is successively dried, and an aseptic solution of cocain five per cent. is applied on pellets of cotton. By this time my assistant has distributed my instruments in the corrugated sections of the white-enamelled instrument-pan and I am ready for operating.

I first use the push-motion instruments, removing the larger pieces of deposit, going around each tooth separately, being careful not to wound that part of the tissue where the periodontal membrane is intact. When excessive bleeding occurs the patient rinses the mouth with warm water—or adrenalin may be used. My assistant now comes to my aid—in order that I may accomplish more perfect work—with compressed-air syringe and small electric mouth-mirror,

standing on the opposite side of the chair. He uses these instruments in such a way that the air will dry and distend the gums away from the tooth, and the reflection of the mirror will enable me to see and remove with certainty the smaller deposits. One strange thing about the use of air is that the slight particles of deposit show up—as they seem to turn a much darker color when dry—and are easily removed.

Having satisfied myself that the roots of the teeth are surgically clean, I next direct my attention to the lifeless disintegrated bone, which feels like soft cheese, even under the touch of a small curette that I use. A delicate sense of feeling and sound tells me when I have reached healthy alveolus. All sharp and thin edges of bone are rounded off so that the soft tissue or gum will festoon over the surface operated on without any irritating point of projecting bone. Often I find it necessary to use the engine and suitable burs to smooth the thin edges of the process.

ROOT-AMPUTATION.

After the above has been accomplished it may be necessary to amputate the roots of some of the teeth. The nerve should be removed with cocain and the canals filled with gutta-percha. I use a new cross-cut fissure bur to separate the root. Some cases have as many as four amputated roots in one mouth. The inclined plane that I leave on the tooth makes conditions self-cleansing. Dr. Rhein goes farther than I do, and inserts porcelain roots where the amputation occurred.

A new section of the gum is now anesthetized and the same surgical exactness gone through with. When I have finished the pockets are thoroughly washed out with a mild warm antiseptic solution, to rinse out all the débris. Loose teeth are now ligated or put in a brace.

This completes the surgical operation. It is all done at one sitting. No one is allowed to disturb me, and I generally finish in from two to five hours. Only the specialist can take the time for this operation. Only he can maintain a delicate sense of touch and steady hand,

which can be acquired by constant practice. The general practitioner, who can only operate about one hour at a time, and spends the next in the laboratory, cannot be expected to have a proper co-ordination between a thorough knowledge of the anatomy of the parts and the fingers. It takes years of experience to tell by the touch of an instrument the difference between dead and living process. The operation is performed under the same aseptic precautions as are used by the general surgeon, and if the work be thoroughly done one has a fresh wound filled with a blood-clot, which soon organizes and forms new tissue. The operation has been done quietly, without any great strain on the patient, and with practically no pain. I seldom see pus after the operation, and the signs of inflammation are less after twenty-four hours than they were before operating. As I am very careful not to mutilate the gum tissue, you could hardly tell that I had done extensive curetting below the surface.

I never disturb the gums again. Some use lactic acid, trichloroacetic acid, sulfuric acid, and zinc chlorid, but in my hands their employment has not been productive of as good results as the method I here describe.

POST-OPERATIVE TREATMENT.

The mouth is dressed by drying sections of the gum with aseptic napkins and applying (with cotton entwined on a broach) a saturated solution of iodine in pure beechwood creasote, letting it flow around and between the teeth. Over this is applied glycerite of tannin with the same kind of applicator. When the napkin is removed and the saliva comes in contact with the medicated gum there is found a membranous coating or dressing similar to that produced by collodion as used by surgeons. The benefits of the iodine contained therein we all know; the astringent feature is produced by the tannin. This dressing unites the gums to the teeth, and food, saliva, and toxic products are thus excluded. The blood-clot is protected until it has organized into new

tissue. This dressing cannot be removed under twenty-four hours. I see the patient regularly every day. The coating of the day before is removed with a soft tooth-brush, the mouth is sprayed with hydrogen dioxide followed with some antiseptic, and the glycerite of tannin is again applied.

After treating the patient for from two to four weeks, until satisfied that new tissue which is hard enough to resist the force of mastication is formed, I spend several hours in prophylactic lessons with my patient, and if he comes back to me with a septic mouth he has only himself to blame.

Dentists are skeptical as to treatment of this disease; some say that it cannot be cured, and extract all teeth affected; others claim that cures are only temporary, and that the condition will return. If it returns it is because the patient has not received the proper training as to the care of his mouth. All honor to men of the stamp of Mills, Rhein, Miller, Smith, Howard, and others, who have developed the branch of prophylaxis. They have started a movement which has a grand ideal and philanthropic motives.

The day has now come when dentists generally acknowledge the fact of oral sepsis, and the benefit of prophylaxis; but still there are a few who claim that the tooth-brush is injurious, that dentifrices wear away the teeth, and that water alone is necessary. Such men are honest in their opinions and we should give them our best and most sincere argument to convince them of their error. When a proper grade of brush is used, and the patient knows how to use it, teeth are not injured by any dentifrice which has merit, though they may use one four times a day for the period of fifty years. In your own mouth for one month use some good paste or cream, followed with a mouth-wash, and then discontinue their use and note the difference. Water alone will not clean our hands and face; worse things get on the teeth, and it requires a mild abrasive to remove them. Patients will be surer to brush their teeth if given a pleasant

paste or cream. Fillings and bridges are kept bright by their use, thereby insuring their longer life. There exists in the mouth an acid condition, with its thousands of destructive germs, which can only be removed by polishing and neutralizing with alkaline ingredients. But above all, in Riggs' disease it is imperative for the patient to understand that where the gum has receded so that the dentin is exposed, it gets rough and more readily collects tartar. It is not reason to claim that water alone is sufficient to keep these surfaces polished and free from deposit.

The mouth-wash and dentifrice that I recommend are made under our supervision. These formulæ we have worked on for many years, and believe them superior to many of the preparations now on the market. The composition of the dentifrice is—Creta præcip., magn. carb., sod. borat., potass. chlorat., sapo Span., ac. carbol., menthol, glycerin. That of the mouth-wash is—Potass. chlorat., sod. benzoat., sod. borat., formaldehyd, gaultheria, glycerin, menthol, thymol, tannin.

When my patients are dismissed it is only on trial, and they are peremptorily ordered to return every month for prophylactic treatment; I then see if they have carried out my instructions as to tooth-brush, tooth-pick, floss silk, and their use. This keeps up the patients' interest in their teeth, and the results are beautiful.

From the vantage-ground of a specialist I make a plea for a more conservative and accurate treatment of this disease. I make a plea for the general practitioner to operate on cases and perfect himself as much as possible in this neglected branch of dentistry. But, for humanity's sake, before you needlessly sacrifice teeth, send the case to a specialist to see if he can save them; and your patients will love you all the more for your interest in their welfare.

Results should count for something. Specialists report a success that has not been accomplished by the general practitioner. Having treated so many cases in the last twenty-five years with such

marvelous success, I naturally am gratified at my own personal results. I have kept a separate list of these patients, and have tried to keep up with them. Most of them had been treated by general practitioners with little success, simply because they were too far advanced for the dentist who has not the time, equipment, or requisite skill to do the perfect operation. Last, but not least, these dentists universally neglected to give the patients the proper prophylactic training. Others have fallen into the hands of dentists who, because they may have seen some little deposits, have informed the patients that the treatment was a failure, and that they might as well have their teeth extracted.

A physician in spite of his learning and skill will have deaths. Riggs' disease specialists cannot cure all cases, nor are all teeth saved by us; but we have been able to cure most of them, and the extreme cases we have relieved of much suffering, and by a proper bridge have kept off the artificial denture.

We have under observation cases treated ten, fifteen, even twenty years ago that have never lost a tooth; and most of these were cases in which the dentist had advised extraction as the only way in which to bring relief.

The most gratifying part of this specialty of Riggs' disease is the appreciation on the part of your patients; and they are ready to give you any reasonable compensation for your effort. The reason why so few dentists treat Riggs' disease is because they have difficulty in securing proper remuneration for what the patient is pleased to call "cleaning the teeth." Dr. Harlan hit the keynote when he said, speaking of the operation for Riggs' disease, "It requires the finest and surest kind of surgery, which is worthy of the largest reward."

Now you have heard how I manage my cases; and if you have any ideas to advance that will contribute to the relief of this affection, I wish to assure you that your suggestions will be most gratefully received, and due credit will be entered to your account in my future work.

THE DIFFICULTIES OF A DENTIST.

By G. E. T. WARD, D.D.S., Schenectady, N. Y.

(Read at the annual meeting of the Fourth District Dental Society of the State of New York, held in Glens Falls, N. Y., April 21, 1903.)

THIS being my first appearance before you, I have refrained from addressing you upon any specialty. It may be from modesty, and it may be from want of originality. Hunting for something original, I found it difficult to discover; so I tune my harp to the minor key and sing my tale of woe—my theme being "The Difficulties of a Dentist."

It is the obstacles and difficulties that beset our path that make the man. Fair weather does not make a sailor. It is work that strengthens the muscles. It is succeeding where success is most difficult to be attained that makes the dentist.

To shut the eyes to the snares that beset one, or to deny the existence of things physical, to deny the reality of matter, does not fit one for the fight against contending forces, when he has awakened to their very present reality. I am aware that some of our profession are immune to difficulties. So scientific their minds, cunning their craft, skilled their touch, that fillings fly into place, crowns are adapted and irregularities are corrected as if by magic! To such I do not write; of such I have no understanding, though at times I have been suspicious that they too work as the rest of us and that only in their talk are they gods. It is with the mortal workman of the rubber-dam and the ill-setting cement that I wish to commune. I do not expect to instruct, but hope to entertain by your very familiarity with my subject. There is nothing new under the sun, and my listeners are not unsophisticated; and after fourteen years of practice I do not know it all, and it may be that my listeners are in the same praiseworthy condition.

The great enemy which we all fight is decay—to prevent loss of tooth-substance, or to restore that which is lost. Incidental to this work is that great and dread terror, pain. To the dentist the question of temporary pain, more or less necessary to accomplish his work, is of secondary importance. To many patients the question of the amount of pain which they will be obliged to tolerate in order to save those valuable organs of digestion involves the question of whether they will save them at all.

THE FACTOR PAIN IN DENTAL OPERATIONS.

Few dentists are so sympathetic that they weep when their patients groan in agony. In fact, our only limit is the patient's toleration. The question you are more frequently asked is, "Will it hurt?" "How much pain will I be obliged to stand?" not, "How well are you going to do this work?" nor, "Will it stand the test of service?" Pain, then, is one of the greatest difficulties in the way of our success—the greatest.

I think one of the greatest temptations which the profession is exposed to is to slight a piece of work because of the resistance offered by the patient due to pain. "Good enough" is ever ready to present us with failure. The very best we can do, inflicting the least pain possible, should be our aim. Perfection of results regardless of method and at any cost may usually be advisable, but not always. I had rather stand before that Great Final Judge and answer to the charge of occasional failure through sympathetic forbearance than to achieve success by wanton cruelty.

This may be heresy; but, be that as it

may, in confidence I will tell you that I don't extend the walls of all cavities for future glory, because my patients won't let me. With every man, woman, and child there is a limit of pain past which they will not go, if it be within their power to prevent. Here, then, is a force with which we contend, which we cannot override carelessly nor set aside, but with which we are obliged to compromise, being neither negligent nor too heroic.

How many times has lack of repose from timidity on the part of the patient made a difficult operation twice difficult; I have had a patient shrink from a bur as if it excited pain, when I was running it backward on the crown of a sound molar, because the added pressure I gave led the patient to expect that some dire calamity was to follow. This was due to timidity.

Extension for prevention is a method of treatment which cannot be decided, for or against, abstractly, but it depends upon each individual case. And a question I wish to ask you gentlemen is this: Is not one of the most important factors in that decision the patient? The people I have worked for appear to be live, animate beings, with a good amount of will and personality; but some of our Western brethren writing upon the subject would lead me to suppose that patients were a sort of raw material and the dentist an arbitrary despot who cut, carved, and hammered into shape small but eternal monuments for himself.

A relief for some of our difficulties is the obtaining of the confidence of the patient; and truthfulness will do much toward it, especially with young patients.

To fool a child is the old story as to whether one is justified in doing evil that good may come. I am tempted to believe that it is sometimes advisable to evade the statement of truth in order to do good, but I do not believe that a lie is wise in order to remove a tooth for a child. If only from the point of view of future work it is unwise to deceive a child, for you will be a long time in restoring his confidence, and the chances are that next time he will go to a dentist that he can trust.

If honesty be the best policy, truthfulness makes the best patient. You may do a difficult operation, with twice the ease, in the mouth of a patient that has confidence in you, that you can do in the mouth of one who distrusts you.

A man came to me recently who presented the most pronounced example of timidity that it has been my lot to meet. He placed himself in the chair (possibly he had heard that the dental chair had a reputation for suffering and torture more to be dreaded than those chairs owned by the state, where a copper cap is placed upon the head to correct irregularities by electricity). Arming myself with no more dangerous a weapon than a mouth-mirror I proceeded to make a superficial examination—when, greatly to my surprise, he proceeded to faint. I could not believe that my terrible and gigantic appearance caused this, so I looked farther for the cause. He was in good health, and had been so with the exception of toothache, and the only cause I could find, as he expressed it, was his terror of pain. By the exercise of some patience, and expressing a few strong but kindly words of advice, I have gained his confidence, and have now as good a man to work for as I care to have.

Among the difficulties in getting and keeping the confidence of our patients is the belief that a good dentist must of necessity be a perfect dentist, infallible and unerring, whose work must needs never fail.

ACCIDENTS IN PRACTICE.

There is no workman, mechanic, artisan, or artist of whom more exactness and perfection is expected. With some people the loss of a filling is sufficient cause for looking up a new dentist. It is in the very nature of our work unavoidable that accidents and failures must occur. It seems most astonishing that it should be expected that a dentist is infinite. I think to a certain extent our profession is responsible for this, or rather some members of our profession; for when another man's unfortunate work comes to us how easy to say, "It

was not properly done, or it would not have occurred," or with a wise shake of the head, "Too bad—too bad!" Thus have the people been led to believe that a failure is not alone evidence—which may be true—but *proof* of the incapability of the workman.

If I did not think I was a better workman than some of the profession I have seen, I would quit your ranks today. If I did not believe there were better and more skilled dentists than myself I should become so self-centered, I fear, that I should perish from the very great responsibility of my burden.

Be as liberal in your praise as you may; be as slow in your condemnation as you can. You will recall the origin of doing "unto others as ye would they should do unto you." "Do by your patients as you would like to have done by yourself" is a better guide than, "What will bring the greatest fee?" To accomplish a given piece of work in dentistry requires the calling into play of a greater variety of talents than any other vocation upon earth. In other words, there are few callings that we as dentists do not need to be more or less acquainted with. Is dentistry a specialty of medicine? is a subject which has not been settled as yet. But we are specialists—expert specialists in every mechanical and scientific calling. Our calling is a composite, uniting in one the physician, scientist, watchmaker, goldsmith, molder, mason, and even blacksmith; the delicate touch of an artist, the strength of a Hercules, the patience of Job, and the perseverance of a Grant. I do not know but that an aspiring dentist would attempt to put a gold shell upon the "appendix vermiformis" from the distance of the oral cavity. Thus do we attempt and thus do we fail!

If we have drawn upon the variety of callings mentioned, to assist us in our profession, we have burdened ourselves also with their trials and difficulties. Would it add to the failures of a watchmaker in adjusting a watch if he were obliged to perform this delicate work in a jaunting-car? Thus are we obliged to chase a fidgety patient around the

chair. Would it inspire heavenly thoughts if the astronomer was obliged to wipe the reflecting mirror of his telescope some dozen times or more a minute?

I have often wondered, if I worked long enough, would the patient's blood all turn to saliva? This viscid and copious fluid may flow under and over our dam, soak our napkins and wet our fingers, but it cannot dampen our ardor; in we plunge, to achieve perfection in a cavern where day never comes, night and darkness being relieved, at the best, by twilight and shadow!

But I am over-hasty; we cannot enter, but must needs work from without, and find the buccal canals of a second molar by faith and not by sight.

Then there is that resident of that dark, miasmatic depth, who though eyeless comprehends, handless but as cunning and skilful as a magician, voiceless but the very creator of language; who is long or short, thick or thin, fat or lean at will, and while without joints or bones is as rigid as iron or as pliable as water! You guess my riddle—this demon I have described—for the tongue, at least to the dentist, is an unruly despot who contends with us for the occupation of every spot or place. This necessary nuisance, this skilful though senseless member is always in the way. It will hurl itself upon a revolving stone, with the asinine propensity of Sancho Panza's knight upon the windmill. Inquisitive and nosy as a village gossip, nothing escapes its notice, and the only confidence you can put in it is that it will do the opposite thing to what you require of it.

I have pictured the opening of the alimentary canal in no very glowing description, and in a man as a child of nature it is not inviting. Darkness, decay, and damp must needs mean dirt, and dirt means denticide and disease.

INFECTED MOUTHS.

A man who commits suicide may rid the world of a nuisance, but a man with a mouth of pus and decay fills the world with a nuisance, puffing into the nostrils of his associates contamination, disease,

and stench. If suicide be a crime, so is denticide. I have taken the liberty of coining the word "denticide" for wilful self-destruction of the teeth through neglect, and I pray you, gentlemen, its adoption. I had rather live within the sound and scent of a merry bubbling sewer than absorb the air laden with the evacuations of the oral cavity of such a man.

To the dentist there is no greater satisfaction than the cleansing of such a mouth. To view your finished work—having eradicated dirt, decay, and disease; restored, purified, and made beautiful and rendered serviceable; banished pain, made whole—this is the glorious, satisfying success, in spite of difficulties.

That dangerous torpedo flotilla of the microbes has not evaded our searchlight in the construction of our work, nor have we forgotten it in our defense for the future.

It is good to succeed, but not fatal to fail.

It is good to do well, but fatal not to do better.

Difficulties surmounted are difficulties no more.

I have occupied a small allotment of your time in what might be called a flippant style, and pointing in a lighter vein to some of our old enemies forever ready to be stumblingblocks in our path. I cannot hope for any sudden decrease in matriculates at our colleges should they learn how difficult is our profession, neither did I purpose to frighten you. I have only paved the way for—and so would extend to you of the dental profession—that honor and glory which is due to a profession that has made itself a rival of nature's own perfection, or a perfecter of nature when she is in fault. It is the dentist who has made the preservation of the teeth possible; it is the dentist who has made that pre-

servation desirable. It is by the change from surrendered millions to saved millions that our profession has won its place.

It is to stimulate ambition, to make the victory over our foes sure by never neglecting to acknowledge them, that I write—to show you what I believe to be the height to be attained, surrounded by difficulties though it may be: *prevention*, which our profession will some day attain; prevention rather than restoration.

This is not new? Well I know it! but we have short memories—excepting the fellow who "did it twenty years ago"—and it may be advisable to point to it once more. We have not attained the height yet. Let us set our aim high; let our ideal be worthy of us, and then strive for it. That which is difficult is worth having.

I have not voiced all the difficulties of a dentist, and I know you rejoice with me that I have not. I did not wish to create a dragon of which I myself should become afraid, but rather do I stand and contemplate one I have laid low, having full confidence that, should he come to life, I can slay him again. My experience is but yours. But there are others, and we must not rest upon what we have done, but look to what we have to do.

Remember that work brings happiness as well as strength. To enjoy the construction and completion of a difficult task brings its own reward. "Dentistry for dentistry's sake" must be our motto. If inspirations in gold are wrought with the love of their creation, golden reward will come for golden work.

So long have we stood before the pearly gates of the oral cavity that when we stand before the pearly gates of heaven I doubt not we shall hear, "Enter thou to thy reward!"—even before we can say, "Open, please!"

PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, February 1904.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, February 16, 1904, at the Academy of Medicine, 17 West Forty-third street, New York city. The president, Dr. John I. Hart, occupied the chair and called the meeting to order.

After the transaction of some routine business,

Dr. JOS. HEAD, Philadelphia, the essayist of the evening, was introduced by the president, and read his paper, as follows:

PORCELAIN FILLINGS.

High-fusing porcelains and low-fusing porcelains have now had so fair a trial that each can be accepted as having distinct value. Dentistry is to be congratulated that both fields are being developed, for only by such development can the perfect porcelain method be evolved. At present the advocates of low-fusing porcelain claim that they can get better adaptation with gold than with platinum, while the advocates of the high-fusing bodies are equally confident that they can make practically perfect forms with platinum, and forms moreover that permit of a manipulation so simple that two ordinary porcelain fillings can be easily made and inserted in an hour.

Many advocates of the low-fusing bodies are at present employing assistants to do what they consider the mechanical part of the work, viz, filling the gold matrices with porcelain, while practically no one using high-fusing material does this, for when the platinum mold is made it takes such a few

minutes to fuse it full of porcelain that an assistant ordinarily would be of little service. The gold-matrix men claim that they can take impressions that cannot be taken with platinum, while the platinum men feel that they can get a perfect mold of anything that has not undercuts, and some feel that they can even take an impression of slight undercuts, because the platinum when once molded becomes so rigid that it will within certain limits spring back into shape.

Those who use low-fusing porcelain claim that their body is of better color and strength, and bring forward scientific tests in support of their claims. The high-fusing men, by their scientific tests, prove exactly the reverse.

All of which goes to emphasize the well-known truth that the experimenter is very apt to see what he is looking for, and that nowhere in the world are we so apt to find poetical imagination as in a partisan scientific discussion. Bearing these facts in mind, the advocates of high-fusing porcelain wish it to be known that each year they are more confident than ever of the value of their method, while at the same time they note with pleasure the large number of conscientious, skilful dentists who continue to work with the low-fusing porcelain—thereby proving that it, too, has excellent qualities.

Inlays, whether of low-fusing or high-fusing porcelain—cemented with zinc oxyphosphate, have revolutionized dentistry and are rapidly proving themselves to have a higher percentage of success

than any other class of filling. That they are destined to prove of greater importance as time goes on cannot be doubted, and therefore it may not be out of place to speak of a few of the difficulties that beset the workers in this field.

The color of the labial fillings is the most difficult to get because these fillings must be both accurately matched and perfectly baked. Inlays in approximal cavities, if sufficiently light, reflect the color from the adjacent tooth, but the inlay of the labial cavity must depend solely upon its intrinsic color. It must be sufficiently deep to have a good body of porcelain, and then if it be not over-baked so as to be transparent, the color of the cement will affect it but little. But if, as frequently happens, it is over-baked to the point of transparency, when tried in the cavity before it is cemented it appears a perfect match from the fact that the tooth-color beneath shines through it; but in the same manner the color of the cement afterward shines through and destroys the hopes of the complacent operator by cutting off the color of the tooth and substituting its own color. Porcelain inlay workers usually undercut their inlays with a diamond disk, but for those who prefer to etch the back of the fillings with hydrofluoric acid, the solution of hydrofluoric acid called "white acid" is valuable. Hydrofluoric acid makes a smooth etch. White acid makes a frosted etch. It can be bought under the name of white acid, but is much more efficient if freshly prepared and kept free from the air, as it has the property of absorbing moisture, which destroys its good qualities. It is prepared as follows: Make a saturated solution of ammonium carbonate in hydrofluoric acid, using a lead dish. Evaporate to one-half its bulk. Add hydrofluoric acid up to original bulk and evaporate again to one-half its bulk. This solution should be kept in a gutta-percha bottle. It will give a surface to the filling to which the cement will tightly adhere.

Sometimes in the course of our daily practice, young women come to us with

large cavities in the lower molars and bicuspid. These may have been filled either with gold that has discolored or with amalgam. In either case the dentist had felt justified in so filling them under the idea that being far back they would not be visible. But such is not always the case. Women at an evening party, as they converse, often sit down while the men stand up, and many a laugh is marred by a row of discolored lower molars. I mentioned this fact to a very bright woman. She answered, "But the upper molars are just as important." I asked her to explain, and she said, "Well, of course it is very silly of the men, but they will sometimes put us up on a pedestal and sit on a cushion at our feet. When they look up and we laugh down—well, the result is not always harmonious." This really is a serious question, and in many instances it is better to fill the grinding surfaces of molars, upper and lower, with porcelain. The matrices are not difficult to form, and the work when finished seems durable.

Sometimes we meet molars and bicuspid that are so badly broken and decayed away under the gum that the preparation of the cavity and the consequent cutting down of undercuts necessitate much sacrifice of tooth-structure. These difficult cases can be made easy in the following manner: The cavity should be prepared as though it were for an amalgam filling. It should be sterilized and dried. The True Dentalloy of Whites', made after Dr. Black's formula, should be mixed to the consistency of putty. Creamy cement should then be put into the cavity and all of it that is possible squeezed out by the amalgam. The edges should be cleansed, the mercury squeezed from the amalgam that is left in the hand, and the dried amalgam put into the cavity so as to take out the excess of mercury from the soft amalgam that was first inserted. This method is well known and needs no further remark. When the patient returns for the next sitting, the amalgam filling can be nicely polished, and then all of the filling that shows can be cut

out and filled with porcelain. Many of these fillings are now in existence that have lasted four or five years. This method is most valuable in bicuspid where the mesial and distal cavities meet and divide the two cusps. To fill these two cavities with two porcelain fillings in the ordinary way is frequently not feasible, owing to the difficulty of getting retention laterally. A chance bite will sometimes loosen one from the other. To make these two fillings as one, under ordinary circumstances, means a great sacrifice of tooth-structure to obtain parallel walls; but if these two are first filled as one cavity with amalgam according to the method described, the cavity for the porcelain can be extended mesially and distally so as to cover all visible amalgam and yet present a cavity most favorable to the formation of the matrix.

And now, since the greatest accusation that is made against high-fusing porcelain lies in the difficulty of forming the platinum matrix, a few cautions on that subject may not be out of place. The platinum should be as soft as lead, without the slightest metallic rattle when it is shaken. In labial cavities that encroach upon the gum margin the piece of foil should be large enough to cover the two adjacent teeth and to go a quarter of an inch up on the gum. The platinum should be held lightly on the two adjacent teeth with the first and middle fingers, and pushed into the cavity with a piece of bibulous paper or spunk, sufficiently far to define the edges, and also sufficiently far to get a surplus of foil into the cavity with which to form the matrix. If the foil be held by the fingers too rigidly it will not allow of the surplus, but will tear under the swaging process.

When the cavity is outlined, the first finger should be pressed firmly against the paper plug in the cavity to hold the matrix in place, while the rest of the platinum is molded to the outlines of the teeth. When this is done, the first and second fingers, as before, can hold the platinum, which will not now move because of its adaptation to the tooth-

surfaces, and the matrix can be spun or burnished to the bottom of the cavity, as the metal above the gum will form a sort of truss that in an astonishing number of cases will push the gum up and expose freely the cervical margin of the cavity.

In taking matrices on the crowns of lower molars, it is often advisable to stand on the left of the patient. This permits the platinum to be held with the left hand, leaving the right free for manipulation.

The method of forming the matrix of crown cavities is as follows: Place a large piece of platinum over the crown, holding it loosely on the sides by the thumb and first finger. Press down the slack in the cavity until the edges are well defined. Then swage the platinum with bibulous paper over the grinding surface to prevent movement. Burnish the edges to make them clean and sharp, and then boldly swage the metal to the bottom of the cavity. If the edges have been formed previously, any tears will not be able to reach them, and will be harmless.

In forming a matrix on the compound distal or mesial surface of a lower molar or bicuspid, the same general procedure is followed. The metal is held lightly, and a large quantity of slack is swaged into the cavity until the edges become defined; then the cavity is packed with bibulous paper and the excess metal molded to the tooth in the form of a half-cap. It is most essential that the grinding surface of the tooth be well covered, as this part of the platinum forms a truss with the two sides that will prevent distortion when the matrix is being removed.

When this much has been done, the edges of the cavity can be burnished, care being taken to exclude all wrinkles, and the matrix swaged to the bottom of the cavity.

When the contour of the tooth forms an undercut that threatens to distort the mold on its removal, the cavity should be firmly packed and the platinum on the sides of the tooth slit with a knife and bent out, making removal easy.

The principle of forming the matrix to corresponding cavities in the upper teeth is the same, only with the upper teeth the operator works on the right side of the chair as usual.

Discussion.

Dr. VAN WOERT. As to the possibility of getting as perfect a matrix with platinum, I will not attempt to raise an objection. I believe I have made some matrices, using platinum, as perfect as any made of gold. I believe Dr. Head is capable of doing that, but I think for all-around, everyday work there is no question but that the average dentist can do better with Dr. Jenkins' material than with the high-fusing. Do not misunderstand me. I am not talking about Dr. Head or any other individual; I mean the "average dentist."

The supposed skill required in forming a platinum matrix for a porcelain inlay is very much overestimated. Dr. Head stated that two inlays could be made and inserted within an hour, and that with the platinum matrix it was unnecessary to have an assistant. So far as the actual time is concerned, I believe I can make and insert two inlays (all things being equal) in the same time, if not more quickly, with the gold matrix and low-fusing body, than I can with the platinum matrix and the high-fusing body; but when you take into consideration that we are busy men, and that every moment counts, it is very much easier to make three, four, or five matrices a day, turn them over to a competent assistant for baking, and insert them the following day, or two or three days later. Of course, if the cavity is in such a position in the mouth that there is a possibility of deforming or defacing the margins that you have prepared, it must be done at once; but approximal margins on the six anterior teeth can always be protected with gutta-percha fillings until a succeeding sifting.

In a large molar or bicuspid the edges of a prepared cavity are apt to be chipped in the act of mastication, if allowed to go for several hours, and

it is better to keep the patient in the office and insert the inlays at once. I cannot see why the services of an assistant are not an advantage when he is competent to do the baking. I would like to have any gentleman present tell me if he thinks it is a thing possible for him to continually bake inlays and not injure his eyes for other work. Even admitting you use smoked glasses and take all precautions, it is an injurious thing. When you can hire men who do nothing else, who do not expect to go to the chair, I think it is a matter of economy.

The formation of the matrices as Dr. Head has described is certainly very clever and I shall profit very largely by what he said. The method of introducing an amalgam filling and covering it with porcelain is entirely new to me and appeals to me very strongly. I believe that matrices can be formed of pure gold in approximal cavities of bicuspid and molars to the gum line with comparatively little trouble, if the proper procedure be pursued.

One of the worst features of making a matrix for an inlay in my experience is the necessity of having to hold it with one hand and work with the other. To overcome this, I have prepared Canada balsam by boiling down or evaporating until it is comparatively hard, so that when I warm an instrument and place it upon it, I get sufficient on to admit of attaching one edge of the gold to the tooth, leaving that edge only in contact. After the gold is pressed into the cavity and a general outline is obtained, the balance is carried to the other side and attached. That leaves both hands free. Dr. Head will raise an objection to this method, so I will anticipate him. He may say that in burnishing it down it will stretch and bulge on the sides. That is so, but when it is nearly full, I pack it full of spunk—not bibulous paper. I take the burnisher, and carry it right over the portion that has the Canada balsam on. Then I have a manicure knife, which is of a spatula form; on one end there is nearly half an inch with an

acute edge on it. With the spunk in position, I simply cut off the gold just inside the line where it is attached with the Canada balsam. When that is free the matrix is easily removed and the remainder of the gold taken away.

If you have a foil-carrier with a suitable end upon it, rounded like a burnisher, that will lock and grasp a piece of spunk, not requiring the pressure of your fingers, you can burnish the edge with spunk almost as well as with metal burnishers. I have three sizes of such carriers, and a set of burnishers that I have had mounted. They are of varying sizes and are mounted in the lightest rubber handles that I can get. The instrument must be so light that it is almost impossible to tear the matrix with it. You do not want one such as you use for gold fillings, but something with which you can burnish down a little fold if necessary; you cannot burnish such a fold with a heavy instrument without danger of cutting it. The burnishers I have might not suit you; but if you make a selection to suit yourself, and have them mounted in light handles, and obtain one of those manicure knives, using a little Canada balsam, you will find the method of making porcelain inlays is simplified to almost a minimum; and if you have an assistant who is competent, let him make the inlays and save your eyes.

Dr. GAYLORD, New Haven. I am more of a listener than a practitioner in this branch. I have made some experiments, and unfortunately some have been unsuccessful. I felt like taking Dr. Head to task, when he announced his purpose of filling the base of the cavity with amalgam; that to me would seem decidedly objectionable. He doubtless sees merit in it, but I hardly think I could adopt such a practice as that. If I should place any material there, I would prefer cement, reaming it well back from the margins, and it would support a frail tooth much better.

Dr. Van Woert's broad assertion relative to the value of the Jenkins body—I would ask him wherein he considers it superior to the high-fusing.

Dr. VAN WOERT. I used the high-fusing body, as I told you, in the beginning. The value of any material is in the results we obtain from its use. There is not a high-fusing body made today that I know of—and I think I have them all in the office—that will stand the crushing strain that the Jenkins body will, that will take the polish that the Jenkins body will, and that you can build up and contour with as sharp and perfect a definition. Moreover, I cannot obtain with any furnace I have yet seen—and I have tried pretty nearly all—from a high-fusing body the satisfaction that the Jenkins body will afford. There is, nevertheless, a deviation in the Jenkins, as there is in all, if it be a little overbaked. Experience teaches you what you want, and you are able to obtain an approximate color that I do not think you can get with any other material. Examining the material microscopically, I find it has a finer, closer grain than any I have seen.

Dr. GAYLORD. Do you not have greater shrinkage?

Dr. VAN WOERT. I have not gaged it by an absolute test, but the material itself is what I am talking about. The questions that belong to the manipulative part are for each operator to overcome. You can grind a Jenkins inlay and put a polish on that you cannot tell from a fire polish.

Dr. EVANS. Although I am very much interested in porcelain, I have not abolished altogether gold fillings. There is one remark the essayist made, as I understood him—that he found porcelain showed a larger percentage of tooth-saving than gold.

Dr. HEAD. I cannot answer that absolutely, because, while we have some gold fillings as old as fifty or sixty years, unfortunately we have no porcelain fillings as old, unless we go back to prehistoric times, when they made fillings of green jade. I think the inlay *per se* will give a higher percentage of success than gold fillings. I stand by that absolutely.

Dr. EVANS. I must take exception to that, and I think I will be supported in

my position by nearly every conservative member here. I have tested porcelain enough to know that it is not as reliable as gold. If the front teeth are sufficiently separated, I consider that an expert can so perform the operation with gold as not to call for the use of porcelain one-fourth of the times it seems to be deemed necessary by those who use it so generally. I believe in gold fillings every time where there is not an exposure of the gold to any considerable extent.

One of the many points discussed by the essayist was the etching of porcelain inlays. As long ago as three years I brought to the attention of this society the value of a diamond point with which to etch the surface of a porcelain inlay. It received little consideration at first, but its value as a method has gradually been recognized. Agents of the Jenkins porcelain have lately had a number of these diamond points manufactured for the purpose. In three minutes, with the aid of a magnifying glass, I can etch a porcelain inlay. I etch the whole surface of the inlay except a mere line at the margin where it comes in contact with the edges of the cavity. I secure by the use of a diamond an etched surface that is superior to anything you can secure by the use of acid. Since I adopted the method in my practice, the loosening of an inlay from its attachment with the cement is almost unknown. If any fractures existed in the matrix, through which the porcelain has protruded, it should be removed a little more at such points than upon the rest of the surface. The benefit is very obvious that is obtained by effectively etching the whole surface of an inlay, leaving the mere edge intact.

As to the comparative merits of the two porcelains—the high- and the low-fusing—I find this in my practice: In the case of an inlay for an approximal cavity, or a cavity that is quite accessible and that permits the matrix to be easily manipulated, it is an advantage respecting time to use the low-fusing; but in a case of restoration of a corner of a tooth, where it is desirable to insert

the inlay several times and accurately determine the amount and form of the contour, I prefer the high-fusing.

As to edges, an expert with a platinum matrix I think can get as fine edges as with a gold one. After the first baking, with the use of a platinum matrix, you can reinsert the matrix and burnish it again to the edges of the cavity. After the annealing it has received in the furnace it becomes very soft, and in the second burnishing you reduce it in thickness. If it be inserted again, after the next baking you can further adapt it and thus get a result that is fully equal to that obtained in the use of a gold matrix. But where we are busy men, and time is an object to us, there is an advantage in the use of the Jenkins porcelain and a gold matrix. You can make the matrices much more quickly.

Dr. LEROY. Dr. Head has said some things that appeal to me quite forcibly. I believe he said that he uses platinum matrices altogether, and the argument was brought out that those who advocated the use of gold for matrices claimed they could obtain a very accurate adaptation—and they can, I do not doubt. Those who use platinum claim they can get a good adaptation—and no doubt they can, also. But Dr. Head said further that by the use of platinum some might take impressions of undercuts, and the matrix could be sprung from the cavity, and probably a better adaptation made. I do not see how, after springing the matrix from the cavity, a filling can be made in the same, and then inserted into that cavity. How can the doctor's argument hold good on that point? I will agree that the platinum theory is excellent, but I do not think there is elasticity of the material that would admit of the reinsertion.

What has been said in regard to matching colors is perfectly true. We find that fillings or inlays vary in color with the positions they occupy. Also, the cement problem is one that contributes very much to the color of the inlay.

I feel like reiterating what has been said before, that although I have not

used the material for inlay work long enough to say whether or not there is to be serious trouble for me in the future, there is one cement that we have all discarded, "archite," which gives me excellent results in this particular direction. I knew that would occasion a smile from most of you, and some comment. Nevertheless, I have set quite a number of inlays with it, and have not had, up to date, more failures with it than I would have had with other cements.

Dr. Reeves of Chicago describes a method of building up porcelain in a matrix, overcoming the shadow problem better than anything I ever heard described. It is the fusing of the porcelain body in the matrix, leaving a surface—probably the thickness of natural tooth-enamel—on which he builds his colors. There, so he claims, he has the opportunity of grading the colors, applying for instance a brown as an underlying and a bluish tint as a surface color, finally enameling all if the color suits him. I have never seen any more beautiful inlays as to color than those shown by him. They were shown in Chicago last year, and also in New York.

The method of changing the color of an inlay after it has been baked—either the Jenkins or the high-fusing—by the application of oil colors accomplishes a little for us. Those inlays we have fused a little too long, where the color is gone absolutely, may be redeemed to an extent by the application of this method, where we have not the time or the inclination to make another inlay.

Dr. HEAD. Dr. LeRoy said that I claimed I could make undercuts. I said nothing of the sort; I said some people claim it. I absolutely disclaim all that.

I want to thank Dr. Van Woert for presenting the advantages of the low-fusing body as well as he has. His statement goes to prove that only by means of the conscientious work done with the low-fusing, as well as with the high-fusing body, can the best results be obtained. I hope and believe that the good results that are to be given to the profession through this porcelain work will come as much from those who develop

the low-fusing as from those who develop the high-fusing body. Whether in time to come, when all this material has been sifted out and the best method is evolved, the student will be taught to use the low-fusing rather than the high-fusing porcelain is a question no one can answer.

Considering the question of the greater strength of the low-fusing body, Dr. Walter Gilbert, of The S. S. White Co., has made hundreds of tests in which he has proved that the high-fusing porcelain will stand more than the low-fusing porcelain. What are Dr. Van Woert's tests whereby he says the Jenkins body can stand more than the high-fusing body?

Dr. VAN WOERT. The ordinary laboratory tests.

Dr. HEAD. Those are very good, but crude and deceptive; the test of usage in the mouth is not always fair. Any porcelain filling with poor edges will probably be chipped, whether it be of high-fusing or low-fusing body. I sometimes think that when we are a little tired, our edges are not so good as at other times.

Concerning the objections to amalgam, I think Dr. Gaylord and Dr. Evans missed the point of the way in which the amalgam was used. The entire filling is put in with cement, and there is an adhesion and a support that cannot be obtained without the cement.

Concerning the relative value of the inlay and the gold filling, as pointed out by Dr. Evans, we know that when a man has hammered and hammered upon a tooth, no matter how carefully, he can never stand up and honestly take his oath that the edges are perfect. It is hard to prove that some of the enamel rods have not been fractured. One cannot say positively that he has from edge to edge and from beginning to end made it absolutely perfect. Nine times out of ten, in gold fillings, when the edges decay, it is because the edges have become infected through leaks. And the reason that the average porcelain filling will outlast the average gold filling lies in the fact that at least the inlay edges are protected by cement, while the gold may not be protected by anything. We look

at the average gold filling—I am not speaking of mine, but of all I have seen—and we often see dark lines on the edge. We call these gold fillings good, in spite of these dark lines, and at the end of eight or ten years, where there has been this slow, incipient, steady decay, we say the filling preserved the tooth during this time. With the inlay, when the tooth begins to decay around the cement, the filling loosens, and drops out. It does not deceive us; while the apparently good gold filling will stay there and let the decay go on.

Where we have but a thin line of cement, that cement will not wash out, while where we have a wider line, in many instances it will wash out. The explanation is simple; there is in the saliva a certain solvent quality. Where we have a cement line sufficiently fine to allow of capillary attraction, mucus will get into it; it will act as a bar to prevent further disintegration. If there is a line sufficiently large to allow of washing, there will be a constant renewal of solvent saliva, and a continual disintegration of the cement. Where we have this very fine line of cement, even if it goes to the edge, we have a filling that is likely to last, since it supports the tooth.

Considering the question of etching: I do not etch; I only gave the formula for those who do.

As to the diamond points, the so-called diamond disks have been in use for fifteen years. I make cuts all the way across the porcelain, and absolutely dovetail the back of the filling with the diamond disk. It can be done so quickly that it does not take over a minute. The filling is absolutely serrated, and the cement cannot let go if it tries.

I was at one time an ardent enthusiast for the double burnisher, but I have since found that if we get a perfect mold the first time and fill it up carefully we are more likely to get a good result than if we put it back again and run the risk of its rocking. If we do not get it back exactly in the cavity the second burnish will do more harm than good. While

theoretically the second burnish is preferable, the factor of personal error of every operator is such that it will often do more harm than good.

I do not feel that I can get as good results by taking impressions and working on a model as by working upon the tooth; but, after all, that is a personal factor. It is only by enlarging our methods of work and our scope that improvements are to be hoped for.

Concerning the articulation of molar porcelain fillings, I go upon the principle that they must not be articulated afterward. We must get the articulation while they are being made, and if we are careful to burnish the platinum down to the grinding surface of the tooth, and carve the filling out well, there is no reason why it should not be right the first time, and if it be not quite right, a little may be taken off the point above.

The way in which we talk about making layers for porcelain inlays sounds to me like making layer cake, as if we had a couple of inches with which to work. With the average filling the first layer you would try to put in would look like a mosquito wing, and the second would look like a cobweb. While theoretically these layers are very effective, the results obtained are not so effective. I have looked at the layer fillings with a great deal of interest, but they do not begin to come up to the ordinary first-class work that I have seen done by those who work in the ordinary way. If we match the tooth, we need not bother about the bottom layers. Match the tooth, and do not overbake; put it in with ordinary yellowish-white Harvard cement that will approximate the color of the dentin underneath, and good results will be certain to follow.

Dr. CARR moved a vote of thanks to the essayist, which was unanimously carried.

Dr. NASH made some remarks about the Fourth International Dental Congress, after which the meeting adjourned.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Regular Monthly Meeting—November 1903.

THE First District Dental Society of the State of New York held a regular monthly meeting on Tuesday evening, November 10, 1903, at the Academy of Medicine, 17 West Forty-third street; the president, Dr. Henry D. Hatch, in the chair.

After preliminary business, the president introduced Dr. DAVID GENESE of Baltimore, Md., who read the following paper, and demonstrated his method:

TREATMENT OF FRACTURES OF THE INFERIOR MAXILLA.

The treatment of the subject mentioned has two aspects: When immediately seen after the accident, or later when separation or contraction of the muscular attachments has taken place. In the first case, the old system has been successful for many years. In the latter, difficulties beset the operator sometimes, and occasionally re-fracture has to be resorted to.

We all are acquainted with the difficulties encountered in obtaining a proper impression in modeling compound of even simple fractures, and the delay in arranging a splint will complicate matters. It is often necessary to so firmly fix the fractured parts to the upper articulation that the extraction of a good tooth has to be resorted to to allow the administration of nourishment.

Again, I must refer to the disadvantages of a fixed interdental splint, with its uncertain internal adaptation, or a hastily constructed metal cap with projecting edges, either of which would prove an obstacle to cleanliness, while with their aid a correct articulation is not always obtained.

The above state of things, combined with a call to a case on the eighth day after fracture, forced upon me the necessity for reform in this class of surgery. I therefore bring for your consideration and approval a system I have tried and which I will briefly describe.

A thorough examination is first made by hot syringing with a good antiseptic to remove blood-clots and débris. I use strong waxed gilling twine to suture the various teeth, drawing them into place as nearly as possible for articulation. Hold the ends of twine firmly forward, press the angles of the jaw, and close firmly to the upper jaw. The jaw is maintained in place by a bandage tightly held over the head.

I then take a hollow linen case such as I will show you. This case or bag is provided with tape ends with a division to allow the ears to pass through the body of the holder. I fill this with a mixture of plaster and gluten of rice. This combination is easily handled and molded without unnecessary haste, but becomes firm in a few minutes and harder each day, and will hold the parts throughout the treatment of the case.

After adjusting this and allowing ten minutes to elapse, the bandage can be loosened and the support of the fracture will be certain.

To prevent internal contraction I construct a metal fastener with silver strip such as is used in polishing. I first tin them separately, then bend as many as are required to meet the case. I hold them with curved pointed pliers, apply a few drops of zinc chlorid and put one end over the spirit or Bunsen burner flame, and it will be soldered in an instant. Follow this up till the whole is

united and you have a most rigid appliance, well shaped to the entire front of the fractured parts.

Drill holes where needed, pass ligatures of gilling twine over the teeth, draw through the holes in the plate, and while at tension slip a split shot on and clamp. This will enable you to take up any slack from point to point, and fasten each by the usual surgeon's knot. By this means a free examination can be made at any time, thorough antiseptic cleanliness can be obtained, and a great deal of suffering is saved the patient, with the greater satisfaction to the practitioner in having a successful result.

I will show you the models of a little boy four years old, who was kicked by a horse. In this case, while some sutures had been put in at the hospital, the frail structure of the maxilla would not let them hold, and the result was a complete breakdown of the lower maxilla, as shown in the model. The poor little sufferer, when I first saw him, could not speak a word. All the tissues had been immensely enlarged, pus was oozing, and I felt sure that the ordinary method here would not succeed. In fact, I tried at first to make an interdental splint of the old form with rubber, and placed it in the boy's mouth. When I went there the next morning to see the little fellow, he was fast asleep and the plate was beside him on the pillow. When he awoke he said he had put it there like the old nurse put her teeth on the pillow at night.

The metal strips which I use for making the splint are such as are ordinarily used for polishing fillings, and are easily obtained. They are readily coated with pure tin in the manner I will describe: First melt a crucible of pure tin over a Bunsen flame, and then make a solution of zinc chlorid by dropping pure zinc in hydrochloric acid until effervescence ceases, diluting it with a few drops of water, and then strain. Dip the metal in the solution and then drop it in the melted tin, and it will come out tinned, as you see. The metal strips are adjusted to the model singly, one on top of the other, and you soon have a

surprisingly strong plate. I then take a pair of pliers that I have made for this purpose, and bend the ends so that the tips only can come together, and then solder. If an extra strengthening be required, tin a piece of steel wire, bend it to suit the case, and add it to the band by soldering.

The bandage I use externally is in the form of a pouch, and is of a size to entirely incase the ramus of the lower maxilla, having tape ends which pass anterior and posterior to the ears, and fasten on top of the head. I can place my plaster in this pouch or double bandage, and so arrange it as to have a most rigid bed to support the fracture. [Illustrating.]

The material I use for mixing with the plaster is gluten of rice; this mixture when set is an intensely hard material which neither shrinks nor expands. This material will absorb from four to six times as much plaster as will water. The crystallization goes on a little slower, but when completed is intensely close. It has great value in other directions, for impressions, models, and the like. It never grows soft in the vulcanizer, and when mixed with the "sump" that The S. S. White Company make for the investment of bridge work it will stand the heat of the blowpipe.

In taking impressions, I first put some water in the mixing bowl, drop in my plaster, and allow it to take up all the water of crystallization it wants, pour off the excess of water, then add a spoonful or two of the gluten, and more plaster to take up the gluten. It instantly assumes a glossy, liquid appearance with not a single air-bubble. I have taken my time in incorporating the second addition of plaster, which would have been impossible with water alone. The setting is retarded at first, but when it begins to set it sets rapidly.

Discussion.

Dr. WM. CARR. I understand that you reduce the fracture and tie it before applying the bandage, and then you have the occlusion. When you adjust this

band and are ready to fasten it, do you remove the ligatures?

Dr. GENESE. That is optional. I would not remove all at once.

Dr. CARR. How long do you retain the provisional splint?

Dr. GENESE. That depends on the patient; sometimes three or four days. In a compound comminuted fracture we get very troublesome work which requires nursing for a long time. A simple fracture is more easily handled.

Dr. CARR. When you remove that, would you put on another bandage?

Dr. GENESE. Yes; a simple bandage. I should begin by loosening one of the ligatures. If there is the least trouble, tighten it up. Granulation will set in, where there is no interference.

Dr. CARR. Can patients masticate?

Dr. GENESE. I should keep them on soft food for some little time. In the case of the child, he was well in a week, while he had been eight days previously in the state the model shows before I touched him. In the second case it took two weeks for union to take place so that we could leave the bandage off.

Dr. CARR. Is it not a fact that with the splint we use now, either in simple or compound fracture—the rubber splint—our patients are unable to masticate? In my cases, after three or four days I have only required them to wear the bandage at night.

Dr. GENESE. That is optional with the surgeon. The patients being comfortable, I have not taken it off until the doctors ordered it. These are generally hospital cases. The only private case I had was the little boy.

The skin underneath keeps perfectly clean. There is no friction, no accumulation of food, it is easily cleaned with the brush and antiseptic fluid, and it is no more than a regulating plate. The splint is on the labial side entirely. The lingual side has nothing more to interfere with it than the ligatures, which are likely to cause more irritation than the plate. You must tighten them very thoroughly or you will have irritation. That is why I advise the shot to be pushed home as hard as possible to get

a tight ligature. You could not attempt to tie it.

Dr. CARR. How would you treat an edentulous jaw?

Dr. GENESE. I would make a similar plate, and then go through the soft tissue and ligate it in that way. You could do it through the osseous tissue.

Dr. CARR. I had three or four cases. In one case the patient had an upper and lower artificial denture. I removed the six anterior teeth and used the bandage. In another case I made practically the same thing, with an opening in front. It was fixation, with good results. I should think that would be preferable to making traumatic injuries.

Dr. GENESE. I have seen silver wires passing through the ramus utterly fail, and necrosis follow. I only bring this forward as a help, not to take the place entirely of old methods; but it has in certain cases a decided advantage over the old style of interdental splint.

Dr. LOUIS C. LEROY. How would interdental splints, such as Dr. Angle uses, do in those cases?

Dr. GENESE. You could not get them so closely adapted as the ligatures of gilling twine, because you have not the tension.

Dr. E. A. BOGUE. I have been listening with considerable interest. I wish Dr. Genese would tell us how he knows this is the gluten of rice.

Dr. GENESE. Because I make it.

Dr. BOGUE. Rice has very little gluten.

Dr. GENESE. It has; but it has enough to make what you see. The way I discovered it was this: I was making a rice capsule to take the place of a gelatin capsule, in a case where the gelatin capsule passed right through the system. The doctor was expecting the action of certain medicines, and he said he would have lost his patient if he had not administered the medicine, although it was very nauseating. I volunteered to make him a rice capsule. I have been four years in trying to make it. I can certainly say that this is rice gluten.

Dr. W. C. DEANE. It has occurred to me that this preparation would be a

valuable adjunct to porcelain inlay and bridge work—that is, if it will stand the heat.

Dr. GENESE. It will; if you mix your plaster first with kaolin, about equal by weight, that would give you more plaster than kaolin, and then, instead of using water, if you mix it with this mixture, it will not shrink or lose its weight, and will have an intensely smooth surface. It will give you a beautiful result in your inlays. Your inlays will come away very clean.

Dr. DEANE. Does the doctor use oil or vaselin on the teeth before he takes impressions?

Dr. GENESE. Neither; I have something here that takes the place of vaselin or fats. The addition of any kind of grease to plaster materially interferes with its fine surface. Grease and calcium will not agree. Therefore I have compounded here, solidified stearate of glycerin with alcohol and water. You can shake that up, and wherever you apply it, plaster will not adhere to that part. It has very little taste to it.

I would say, if you wanted to place any bandage in ordinary surgical work, you can take these roller bandages, such as I have here, and fill them full to the very end, bind them round, and you have a bandage that will stand its own all the time. I would mix it in the stockinet and then roll it with a stick or anything else. It is called a bandage for maxillary treatment.

Dr. J. BOND LITIG. The possibilities of this plaster mixture seem very large. I think we can utilize it in very many cases and many ways, and if as Dr. Genese says it gets so very hard, I do not know whether we should use anything else for making casts for plastic work at all. It is certainly very much harder than anything I have seen, and takes an excellent impression, and in every way, from the general appearance of the mixture, I think it is a very good thing; I am very glad I was here to hear it explained. Dr. Genese spoke of it last summer in New Jersey, and said he would be here sometime to demonstrate it. As to his splint, I think it is

applicable to many fractures, but not to all. I think it will work very well with simple fractures, or with very young patients; but where the muscular action is very great, I doubt if it would hold in place the fractured parts.

Dr. R. M. SANGER, Orange, N. J. I can only add my thanks to that of the other gentlemen, for Dr. Genese's demonstration. I certainly think the doctor has shown us a great improvement in the manner of forming models, and making plaster in such form as will be of infinite use to us.

Dr. H. D. HATCH. It struck me this would be a very good material for life masks. Is there anything in it that would be injurious to the eyes? The gentleman who volunteered as patient this evening said it hurt his eyes.

Dr. GENESE. It might make them smart a little, but it would not be injurious. There is a little formaldehyd in the preparation which caused that smarting.

In regard to making a mask, this material was poured on to the living ear, and taken off as clean as this model shows. This was absolutely taken from a living subject, and the plaster was poured just as you see. It gives you an idea of how perfect it is.

Dr. HATCH. In taking a life mask, does that material take the delicate contour of the lips as exactly as the ordinary thinly mixed plaster?

Dr. GENESE. Yes; in the case where the model of the ear was taken, although that was a cleanly shaven face—shaved that morning—you can see already the suggestion of the stubble. You can take a cast from the hair without its sticking to it.

Dr. TRACY. Can these preparations be had at the dental depots?

Dr. GENESE. Yes.

A vote of thanks was extended to Dr. Genese for his excellent lecture and clinic.

The SECRETARY. Before we adjourn I want to bring up a matter regarding the International Dental Congress to be held in St. Louis in 1904. I have been appointed chairman of the Congress

Committee for New York State. I have associated with me Dr. Tracy from this district and I have endeavored to add to that committee the various secretaries of the other district societies in this state. I have succeeded to some extent in getting them to be members of the committee. The object of the committee is in the first place to secure members for the Congress. The members will have to pay a fee of ten dollars each, and everyone applying for membership must be indorsed by the chairman of the state committee.

The committee expects that the various societies will make contributions to a general expense fund. That has been done to some extent in the local societies in the upper part of this state, they having contributed according to their means. Whether it would be wise for this society

tonight to take any action in that regard, I do not know; but I think it would be establishing a good precedent for the other district societies, to know that this society had made a generous contribution.

I would move, if it be in order, that this society contribute the sum of \$250 to the Congress fund for general expenses.

Dr. Carr seconded the motion.

Dr. CARR. This money is to be expended in entertaining foreigners. Every time we have had an international congress on the other side of the water they have treated the Americans royally, and we want to do the same to them. I would like to see this pass.

The motion was carried.

Adjournment.

B. C. NASH, *Secretary*.

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Thirty-fifth Annual Union Convention.

(Continued from page 221.)

FIRST DAY—*Afternoon Session.*

(Continued.)

THE subject was passed, and Mr. Robert Brewster, Chicago, Ill., read a paper on "The Avoidance of Opacity in Porcelain Inlays, and the Use of Oil Colors in Porcelain Work Generally." (Published in full at page 276 of the April issue of the COSMOS.)

Discussion.

Dr. C. H. LAND, Detroit, Mich., said he was much interested in the paper, as it treated of a subject which he had been studying for the past thirty-three years; but he could not agree with the essayist in the use of paints. He said that the manufacturers of porcelain had practiced the mixing of porcelain bodies for the

manufacture of artificial teeth for the past forty years, and that this was done without the use of paints. He did not see the necessity for using paints when the porcelain bodies were properly blended. Opacity, he thought, was not overcome by paints, but on the contrary it was increased by them. The object was to use the proper bodies and blend them in such a way that they would not change color.

In speaking of high-fusing bodies, he did not recognize the so-called high-fusing bodies as such. The only high-fusing bodies were those used in the manufacture of teeth, and this he thought was the nearest to the true type of porcelain body. In giving a definition of porcelain he said it was in its first stage a semi-vitreous mass which, when

entirely vitrified, would remain translucent. The enamel covering should be a little more translucent, which gives a greater depth to the translucency of the mass. If you have thin surfaces that are not translucent, it makes no difference how much they are painted from the outside, the opacity will always be present. This, he thought, was due largely to the cement, and in his experience he had not been able to entirely overcome this. He said when he first introduced a system of inlays, some sixteen years ago, it consisted of three different colors of bodies, and these were to be blended in such a way as to get the proper results. His practice was in building up the body, to have the first a very high-fusing, and as the body was built on, to reduce the temperature gradually. There were, however, a few cases where he thought it might be advantageous to use the paints, but in the last eighteen years he had not used one bottle of paint in this work.

With regard to the prevalent idea that cement would all wash out of these cavities, he said that when they were adjusted with reasonably close joints the cement would not wash out. There was a superficial washing out which sometimes altered the color of the porcelain, but in his eighteen years of experience in this work he had never known cement to wash out entirely. With a good adaptation to the tooth, and with a reasonably close joint, the cement was almost inaccessible to the saliva, except this superficial washing of which he had spoken. He had tried for a number of years to prevent this superficial washing, and he thought that within the last two years he had found a material that would overcome that. This material was what he called his cement media. The peculiarity of this media was that a portion of it was fired on to the body of the porcelain, and when the fluid of the cement came in contact with this a chemical union was formed which made it practically inaccessible to the saliva. He had had remarkable results, he said, from the use of this material, and when it was used, and the proper blending of the colors in the bodies was

obtained, there was no need whatever for paints of any kind. He said he would show specimens in his clinic where this material had been used, and where the joint had been subjected to boiling for a considerable length of time, without the material being affected in the least. He would also show a patient where the teeth had been capped with a very thin porcelain body, in which this material had been used, which would demonstrate to a certain extent what had been attained in this respect.

Dr. B. S. HERT, Rochester. The idea of Mr. Brewster in having three different grades of body is something that appealed to me as a good thing the minute I heard it. It is like the different grades of solder in crown and bridge work. The foundation is built, and the others are put on that without changing the condition of the foundation. By putting the foundation body first, and getting your matrix in shape, it can as a rule be held in shape during the after fusing, although I have had change of shape in fusing after using the foundation body. That is one of the greatest troubles I have had—the change of the shape of the matrix. In some cavities I expect the matrix to change its shape. I would like to hear from Dr. Land as to his ideas on this subject. One of our greatest troubles is in the fact that the porcelain will not stick to the tooth. A number have advocated cutting grooves in the porcelain, but as the cement adheres to the porcelain and not to the tooth, I think it would be better to cut the grooves in the tooth rather than in the porcelain.

Dr. F. W. PROSEUS, Rochester. I was very much pleased to have the opportunity of listening to the paper by Mr. Brewster and the discussion by Dr. Land. I think that porcelain workers, especially in this vicinity, are like the army in the wilderness—they have their troubles. I think we have a great many who will never get any farther than that with it, while we have men who will do splendid work in this line. A person starts out in this work and apparently meets with success from the beginning—more success than in the manipulation of gold

with the same amount of experience; but when he comes to the point of the bodies changing color, he realizes that he is not yet out of the wilderness. I feel that those who look upon porcelain work in a pessimistic manner are entirely in error. It is encouraging to us to see such a man as Dr. Land demonstrate the fact that for eighteen years he has been meeting with success in this work. I think the man who has had a short experience in porcelain work ought to be stimulated to apply himself more closely. I have been doing a good deal of this work, and if only a few of these cases are successful I think I am doing well.

There was another point I would like to speak of, and that is with regard to the grooving of the teeth in setting an inlay. I think this is of great importance in holding the inlay in position, and nothing is more discouraging to the young worker than to have an inlay come out after a few weeks.

Dr. W. V-B. AMES, Chicago. I cannot discuss the question from the inlay standpoint, but have had a good deal of experience with porcelain in continuous-gum work. My general understanding of the question is that it is more difficult to obtain good results from small masses than from large ones. It is more difficult, of course, to get the proper colors and shades. I have been satisfied, though, that a great deal can be accomplished in the way of blending porcelains from seeing the work of Mr. Brewster. I naturally take a good deal of interest in inlay work from the standpoint of cement; and my fourteen years' experience in making gold inlays, and what few porcelain inlays I have made, have taught me the fact that the talk as to the cement being the weak point in inlays is not worth considering, because, where there has been the proper preparation of the cavity and the proper joint has been made, it will be seen that there will only be a little superficial washing out of the cement, and by using an explorer it will be found that this seldom extends beyond the enamel line, where there is not so much danger as if it extended beyond that into the dental region.

The point of the adherence of cement to the wall of the tooth-structure has been brought out, and I would suggest that by etching the cavity walls you will get a better hold for the cement.

Dr. F. E. HOWARD, Buffalo. I was very much interested in the paper, and in the remarks made by Dr. Land. It is worth a great deal to us to have the opinion and experience of men who have been practicing so many years as Dr. Land has. What Mr. Brewster has said with regard to the different colors being combined I think is a very strong point, because we must admit that there are but few cases in which one single color will meet the requirements of the case. I would like to ask Dr. Land one question. I have seen a good many inlays where, after they had been in for a length of time, they would have a yellowish cast around the margins. I would like to know what that is due to. Is it due to a slight discoloration of the cement?

Dr. LAND. Yes. The slight superficial washing out of the cement makes the discoloration referred to.

Mr. ROBERT BREWSTER, Chicago. There is no doubt that Dr. Land has had very considerable experience in porcelain work. I would like to refer to a few points in the paper which seem to have escaped his notice. The value of oil-color paints in inlay work lies principally in producing effects not obtainable with the porcelain bodies. In their outward application to inlays I was recently convinced of their value in two cases in practice, one a large contour filling in a lateral, the other the entire incisal half of a central. In both these fillings perfect color was produced by painting the outer surface, thereby saving the time and trouble of re-making these inlays.

Dr. Land uses very high-fusing bodies—he said he would like all the bodies to fuse at 3000° or 4000° F. We must limit the fusing of the porcelain to the capacity for baking. If the electric furnaces would reach up to that point, it might be well for us to have them; I think, however, that porcelain fusing at about 2400° is as high as we need to go. As to the point I suggested in the paper,

of lining the matrix with a very dense body of the high-fusing material, I only estimated the fusing-point at 2400° ; it may run as high as 2600° . Those bodies that fuse the highest are not necessarily the best in the mouth. For instance, you may have a tooth which when held up to the light will look almost transparent, but when placed in the mouth will not represent the natural effect desired. The whole thing depends upon the proper manipulation of the porcelain. The foundation body should be the darker and least translucent, the other layers more translucent. The whole secret in inlay work is in reproducing in porcelain the natural effect as found in the tooth.

To overcome the cement trouble, my suggestion is to line the matrix with a highly reflecting body and have the light reflected back naturally, and so prevent the rays being absorbed by the cement. This layer of very high-fusing porcelain placed in the matrix will probably give the proper reflection.

I am rather in the attitude of an inquirer with regard to this question. What I wanted to do was to point out the advantage to be gained by the blending of porcelain bodies. It does not matter whose porcelain it is; the thing we want to get, is the best material for the purpose. Dr. Land mentioned the fact that the bodies should be capable of being repeatedly fused without changing

color. This should not be difficult. I have a low-fusing body made at the request of several of my dental friends, which can be fused twenty times and it will not change color.

With regard to the cement washing away—as has been pointed out, it seldom goes more than a line below the surface—the general plan is to etch the inlay with hydrofluoric acid, groove the cavity, dry it thoroughly, and use the cement whilst in a sticky condition, holding the inlay firmly in place until the cement hardens.

With regard to retaining the shape of the matrix, I think the better plan is to always refit and burnish the matrix after lining with the foundation body. No matter how careful you are, there will be a slight contraction in the matrix on the first bake. To overcome this I adopt the plan of cutting a fine groove down the center of the porcelain, dividing it into two parts so that in the baking it will bake on either side; in the second bake fill this groove up. Some practitioners advocate reburnishing the matrix after each bake. Dr. Reeves says he does not find occasion to reburnish after the second fusing; and there is really no necessity for so doing if the correction be made before the enamel body is applied.

On motion the subject was passed, and the meeting adjourned until Tuesday night.

(To be continued.)

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PHILADELPHIA, MAY 1904.

EDITORIAL DEPARTMENT.

A VOICE FROM THE PAST.

WE published in the DENTAL COSMOS for February 1904, at page 149, a review of a work upon dental anatomy entitled "Précis d'Anatomie Dentaire," by Prof. J. Choquet of l'École Dentaire de Paris. The review expressed a favorable opinion of the work, which opinion was formed upon a critical and comparative study of its contents. We did not take into consideration the personality of the author, his preparatory or professional education, his age, social station, or family relations. We based our opinion of his book solely upon the internal evidence which the work itself afforded. We learn, however, that the basis of literary analysis above referred to is not above criticism; for in the *Revue de Stomatologie* for March 1904 appears a review of the same work by Dr. Cruet, dentiste des hôpitaux and one time president of the Société de Stomatologie, in which the reviewer totally ignores the contents and character of the work, and confines his attention to a critical analysis or review of the author's fitness to write a book. Cruet says of Choquet and Choquet's effort:

If it were my desire to review the work alone, I would speak of it and not of the author; but they are inseparable, being united by indissoluble bonds.

Dr. Cruet then states that he cannot overlook the fact that Dr. Choquet is not a physician, that—

He has not pursued scientific studies of a character leading to the M.D., and not even, I imagine, continuous scientific studies; he is merely the most perfect product and the best example of what dental education can accomplish, and represents its teachings in the highest degree. . . . Thus as long as Choquet limited his energy to partial investigations on certain questions of histology and anatomy, to laboratory experiments, etc., which are all within the reach of any good observer or ingenious mind, he did useful work, per-

haps original, and has doubtless made for himself a place in the front rank of those workers to whom both credit and gratitude are due. But Choquet, whose knowledge of general and dental anatomy is doubtless fragmentary and the result of obstinate work, assumed that he could gather his knowledge into a book concrete and complete, wherein he would bring out a number of facts and general ideas; and he has failed utterly.

Dr. Cruet then proceeds to state why the book, which it would seem as though he had not read, is a failure. He says:

It is an understood fact that it could not have been otherwise, because it is not sufficient to have frequented laboratories late in life, or to have been under the guidance of eminent professors, or to have examined the collections of museums . . . to be in a position to write truly scientific works. To do this, indeed, is not possible unless one has become slowly impregnated through a long process with that scientific spirit which penetrates only those having a solid general education. This lack of educational preparation is in evidence in every page of the so-called "*Précis d'Anatomie Dentaire*" by Choquet. The author, who thought on first consideration that his special studies and investigations fitted him for the task, has absolutely failed where any medical student of energy and intelligence would have succeeded, or any educated physician a non-specialist.

If good books cannot teach science and medicine to incapable students who through lack of time and preparation are rendered powerless to derive any benefit from such teachings, what may be expected of mediocre or even bad books?

It is not sufficient to have attended dental schools and even to dwell amongst the most eminent dentists to fit one to write a book on scientific character; it is necessary to have the preparation resulting from a college training and a university degree from its faculties.

All of which sounds strange to those who have achieved something of an intelligent comprehension of the evolution of our ideas of education in general and of medical education in particular. A very respectable majority of the most advanced thinkers along educational lines have long ago gotten beyond the blind bigotry which prescribed that education necessarily meant the training of all men within the narrow limits of the classics, and that the pursuit of any other knowledge was not education. And further, it has been found by practical experience that the contention that a medical man because he is the holder of a medical degree is therefore qualified to pass judgment upon questions arising in all departments of the healing art is a false pretense. No one today consults a gynecologist for an ophthalmic difficulty or a laryngologist for typhoid fever, nor does the sufferer from dental disorders as a rule consult a physician—at least in America, whatever they may do in Dr. Cruet's neighborhood. And as to the writing of books, we think that the warrant to do so is the ability to write them well; and if the result be the measure of the right then Dr. Choquet has demonstrated that he possessed the right, regardless of the kind and variety of letters that he may be legally entitled to append to his name.

We presume that the M.D. which Dr. Cruet is authorized to add to his patronymic constituted the warrant, according to his point of view, for the production of his own work entitled "*Hygiène et Thérapeutique des*

Maladies de la Bouche." We have yet to learn that it has become a standard text-book on the subject of which it treats, or has to any extent whatever modified dental practice even in the city of its birth.

It is not true that any medical student of energy and intelligence, or a physician a non-specialist would have carried out successfully such a work as Dr. Choquet's unless he had pursued such a course of training as the author pursued in dental histology and anatomy. We challenge Dr. Cruet to produce in evidence one single book of the character of Choquet's work done by an author with an exclusively medical training, or any work on a strictly dental subject written by an exclusively medical man that has today any place as a standard text-book in dental or medical educational institutions. Dentistry acknowledges unreservedly its debt of obligation to medicine, but most dentists and most medical men today realize that the obligation is not all on one side.

Physicians from the days of Hippocrates and Galen have been looking at the human tongue and with an expression of owl-like wisdom and with an ominous shake of the head have pronounced the diagnosis. Modern dentistry is evolving from scientific research the data upon which medicine shall be able to make a rational diagnosis from mouth conditions in so far as they apply. Medicine has sought long for the means to resolve the problems of nutrition: dentistry is adding its quota of knowledge to that problem. Medicine is searching for the etiology of many infections and pathological manifestations in the viscera and gastro-intestinal tract: dentistry is pointing to the oral cavity as the portal of entry of the excitors of these pathological phenomena and demonstrating their causal relationship. Dentistry is offering to surgery evidence that in sterilizing his hands, his armamentarium, and the area of surgical procedure the surgeon is doing but a partial duty if he neglect to sterilize the mouth of his patient, especially in all abdominal cases, and notably in the surgery of the appendix vermiformis.

These are considerations which seem to have been ignored by Dr. Cruet. Perhaps he was not aware of them. They have become subjects of inquiry by the trained dental specialist simply because the medical course has generally failed to give them the attention they deserve.

Moreover, we are of opinion that the mediæval attitude of Dr. Cruet with reference to the impossibility of a dentist being qualified to speak upon his specialty simply because he is not an M.D. is not shared either by medical men in general or by dentists at all. Louis Pasteur, so far as we are aware, was not the possessor of a medical degree, yet we hear today more of his work in America even than we do of "*Hygiène et Thérapeutique des Maladies de la Bouche*" par Cruet. Considering the importance and magnitude of Pasteur's work, it appals us to contemplate what it might have been had he only accepted the degree of M.D. when it was offered to him; that is, of course, assuming that Cruet's contention is correct.

No! We think—or, to use Cruet's form of expression, we imagine—that the whole difficulty has its foundation in that narrow-minded view which was so clearly portrayed by *Æsop* in his fable of the discontented goat that wanted to be a sheep; and our observation leads us to the conclusion that the dentist and the physician are not convertible quantities, just as was the case with the sheep and the goat in the fable. Both physician and dentist fulfill important functions as servants of humanity, and the more the "holier than thou" factor is eliminated from their relations the more will mutual respect be enhanced, together with their respective usefulness.

Titles may mean much or little; it is ability that counts when something is to be done, not the letters after a man's name:

The rank is but the guinea's stamp;
The man's the gowd for a' that.

AN EXPLANATION.

IN justice to Dr. C. S. Case, whose article appears in this issue, we desire to state that the use of the word "canine" instead of "cuspid" is in accordance with the office standard of the DENTAL COSMOS, and not in accordance with the views of the author, who gives preference to the latter term. An expression of Dr. Case's views on the subject came too late to make the change in the text.

We publish here also for the same reason the following item of credit which was intended as a footnote to Dr. Case's paper:

In the September Cosmos of 1891, Dr. Edward H. Angle published the unique method of bringing down impacted upper cuspids with rubber ligatures attached directly to the lower teeth, and consequently he was probably the first to publish the application of the elastic intermaxillary force used in this way.—C. S. C.

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IRREGULARITIES OF THE TEETH, AND THEIR TREATMENT. By EUGENE S. TALBOT, Professor of Stomatology, Illinois Medical College, Chicago, etc. Fifth Edition. Philadelphia: The S. S. White Dental Mfg. Co., 1903.

This the fifth edition of Dr. Talbot's work is practically a reprint of the previous edition, issued in 1901. As is well known, it embodies the author's investigations on the etiology of irregularities

of the teeth and deformities of the jaws. In the introduction he outlines "the developmental principles governing heredity and environment so as to facilitate their application to the topics discussed in the different divisions of the subject."

The field of Dr. Talbot's experiments covers a period of over thirty years, and the amount of time and labor expended in collecting the data which have served

as the foundation of the principles and laws enunciated in the present treatise can be thoroughly appreciated after a glance at the long list of works which Dr. Talbot has consulted.

The work is replete with interesting data on the constitutional origin of dental abnormalities and on the part which the factor degeneracy plays in the pro-

duction of deformities of the head and its contained organs.

Works such as the one under consideration are commendable not only because of the character of the information they contain, but furthermore because they doubtless act as missionaries on behalf of scientific research.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Oesterreichisch-ungarische Vierteljahrsschrift für Zahnheilkunde, Vienna, October 1903.*]

TWO NEW FILLING MATERIALS: SPONGE TIN AND TIN-CEMENT. BY DR. ARTH. SCHEUER, TEPLITZ, BOHEMIA.

Dr. Scheuer after a series of experiments came to the conclusion that tin for dental purposes could be used to advantage in the crystallized form as sponge tin. It is easily manipulated and can be used as a basis upon which crystal gold can be condensed to finish the filling. Occlusal cavities in molars and bicusps may be filled with sponge tin up to a short distance from the enamel margins, and the operation is concluded by condensing upon this tin foundation a layer of crystal gold. The tin is condensed by means of pluggers of the Royce variety, or of those usually employed in connection with crystal or sponge gold. The author remarks that crystal gold is the only kind that becomes thoroughly united with sponge tin, and consequently at least the first layer condensed upon the tin should be of that variety. Sponge tin is likewise indicated for cavities in the front teeth, but a special procedure is necessary in order to avoid the dark and pulpless appearance which would surely follow the filling with tin of cavities having thin walls. He recommends to line the cavity with gold foil No. 30. A sheet of this gold is introduced into the cavity and is worked exactly as when preparing matrices for porcelain inlays. The floor of the matrix is cut crosswise with a sharp excavator, and the flaps are condensed against the walls in order to in-

sure the stability of the partial matrix. The cavity is then filled with sponge tin and crystal gold, and if desirable the operation may be finished with gold foil.

The preparation of sponge tin is by no means complicated. The materials employed should be chemically pure. One hundred grams of chemically pure stannic chlorid are dissolved in one liter of water. The precipitation of the tin is brought about by suspending in the solution a plate of chemically pure zinc. The precipitate must be washed repeatedly and also boiled until the water shows no cloudiness whatever, the purpose of this thorough washing being to remove all particles of zinc chlorid. The washing should be continued until the litmus-paper test shows that all traces of acid have been removed. Stannous chlorid does not give the same results, as the precipitate does not have the felt-like structure so desirable for dental purposes.

The author then refers to Dr. Hahn's experiments on combination cements, and particularly to his preparation of pulverized crystal gold one-third and zinc oxid two-thirds. This combination did not, however, produce the good results expected from it, and consequently led to further experimentation. The preparation which Dr. Scheuer now recommends is one composed of finely pulverized tin sponge and zinc oxid mixed with glacial phosphoric acid. The powder is of a light gray color, becoming slightly darker when mixed with the acid, but regains its original color after setting. A tin-cement filling can be easily inserted, and when polished it has a metallic appearance.

PROSTHESIS OF THE SKELETON. BY DR.
FLORESTAN AGUILAR, PROFESSOR OF ODON-
TOLOGY, UNIVERSITY OF MADRID.

After reviewing the literature of the subject, Dr. Aguilar reports the case of a woman aged thirty-four, in whom a syphilitic lesion of the acquired type gave origin to osteitis and caries of the central portion of the horizontal plates of the palatal bones, producing a perforation a quarter of an inch in diam-

The case was one demanding special and unusual treatment and a high degree of surgical and mechanical skill, as the operator had to devise means to supply, first, a mechanical substitute for the missing bony skeleton; and second, a proper substitute for the external soft tissues.

After obtaining a mask of the face, the essayist devised the operation which will now be described and which was successfully per-

FIG. 1.



FIG. 2.



eter. Shortly after the appearance of this lesion, a small abscess developed upon the right side of the nose, which after having increased considerably in size produced an orifice and eventually destroyed the lateral walls of the nose, the crest of the vomer, and all the soft tissues of the nose, with the exception of part of the alæ and a portion of the cartilaginous framework, as shown in Figs. 1 and 2.

After the progress of these syphilitic lesions had come to a standstill the patient sought Dr. Aguilar's advice, requesting him to study her case in view of devising some means by which the unsightly appearance might be improved. The problem was a complicated one, as the extent of the lesions precluded the employment of auto- and heteroplastic methods, and furthermore because the ravages of the infection had destroyed almost entirely the supporting framework of the nose.

formed in collaboration with Professor Hohr of the Faculty of Medicine of Cadiz.

Upon this mask the nose was built up with wax, and from this model a zinc die and a lead counter-die were obtained. Upon the zinc die the apparatus shown in Fig. 3 was constructed. It is composed of three platinum tubes $\frac{3}{10}$ of a decimeter in diameter. The middle tube is provided with a pin at either extremity for adaptation at the anterior nasal spine and at the intermaxillary symphysis. The lateral tubes are soldered to the middle tube, and the finished appliance offers a well-shaped framework for the support of the soft tissues.

The bony margins of the nasal opening were exposed, and after drilling small holes in the osseous tissue the apparatus was securely fixed *in situ* as shown in Fig. 3. A flap of tissue of the proper size and shape was then dissected from the patient's forehead and

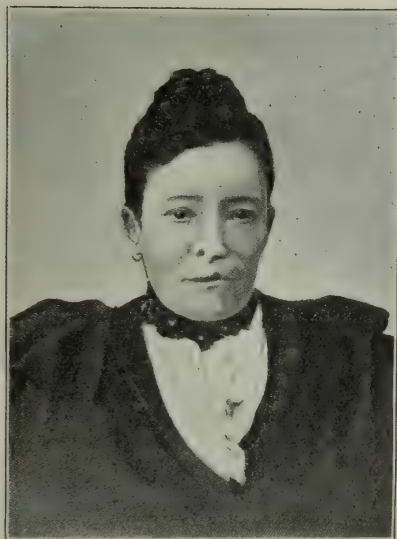
was carried over the metallic skeleton and grafted to the freshened edges of the wound. The wound in the forehead was covered up with skin dissected from the arm, and healed by first intention.

FIG. 3.



The opening in the palate was closed by means of a rubber obturator attached to a plate containing several teeth to supply the missing natural organs.

FIG. 4.



The patient has completely recovered and the result of the operation may be seen by her appearance as shown in Fig. 4.

[*La Odontología*, Madrid, March 1904.]

TREATMENT OF FACIAL NEURALGIA BY INJECTIONS OF ALCOHOL AT 60° C. BY DR. G. TOURTELOT.

Dr. Tourtelot (*Revue de Stomatologie*) describes four cases of facial neuralgia of dental origin successfully treated in from three to four days by means of subgingival injections of alcohol at 60° C., after having tried without any result whatever a considerable number of anti-neuralgic remedies. The *modus operandi* is very simple and consists in injecting 1 cc. of alcohol at 60° C. deeply into the gingival mucous membrane at the point at which the pain seems to originate. The introduction of the warm alcohol into the tissues produces a burning sensation and a pronounced swelling, which disappears concomitantly with the pain in the course of two or three days. The injection, if found necessary, may be repeated in the course of a week. The author states that the results may not be permanent, but recommends this method to relieve temporarily the exceedingly severe pain in cases in which anti-neuralgics prove valueless.

[*Défence Médicale*, Bordeaux, March 1904.]

SUBJECTIVE AND OBJECTIVE PHENOMENA INDUCED BY SOMNOFORM. BY DR. G. ROLLAND.

All who have been anesthetized with somnoform unanimously acknowledge that during the period of induction they experience a feeling of anxiety which they seem powerless to combat. The expected operation, the fear of pain, and that sense of danger always associated with anesthesia contribute to awaken this unpleasant sensation. The primary effect of the anesthetic is one of cerebral stimulation—cerebral hyperactivity. Shortly after inhaling somnoform patients lose the power of estimating time, and any act whatever seems to them to take up five and perhaps ten times longer than is actually the case. They retain, however, during that period a certain degree of consciousness, but soon the initial cerebral hyperactivity gives way to a state of subconsciousness. The sense of hearing is the first one to disappear, and also the first to be regained. Upon returning to consciousness some seem happy, others act indifferently, but all seem for awhile unable to recognize their surroundings.

Under the heading of objective phenomena the author classifies patients into three different and distinct groups: (1) Those who throughout the anesthesia remain perfectly quiet; (2) those who exhibit restlessness, and

(3) those who show marked signs of excitement. Ninety per cent. are of the first group, nine per cent. of the second, and one per cent. of the third. Patients of the first group are carried to the stage of full anesthesia in from fifteen seconds to one minute, and the period of unconsciousness lasts from thirty seconds to five minutes. In patients of the second group the period of induction varies from thirty seconds to one and one-half minutes, and unconsciousness lasts from thirty seconds to five minutes. Restless patients have involuntary micturitions during the anesthesia or seem nauseated and vomit upon regaining consciousness. Patients who become excited are usually those addicted to the use of tobacco, alcohol, etc., also epileptics and those with hysterical tendencies.

Dr. Rolland has anesthetized over 18,000 patients and thus far has no accidents to record.

[*L' Odonto-Stomatologia*, Naples, February 1904.]

HEMOPHILIA. BY DR. VINCENZO GUERINI, NAPLES, ITALY.

The author states that hemorrhage must be counted among the most common and dangerous after-effects of tooth-extraction, and refers to the work of Moreau, published in 1873, wherein is found a series of twenty-six fatal cases collected from the literature on the subject, in order to emphasize the seriousness of certain cases of post-extraction hemorrhage. Dr. Guerini is of the opinion that in general such fatal cases are the result of incompetence on the part of the attending surgeon.

Hemorrhage consecutive to the extraction of teeth depends on various causes, some local and some general.

In this paper the author limits his discussion to the general causes, and particularly to one—the hemorrhagic diathesis. In all cases of tooth-extraction the small apical vessels are necessarily lacerated; this of itself, however, produces only an insignificant outflow of blood, for two reasons: First, because when the vessels are in a healthy condition they contract and shrink as soon as severed; and second, because when the composition of the blood is normal it immediately coagulates, and the clot thus formed acts as a tampon, preventing any further loss of blood. These phenomena do not occur when through a general pathological disturbance the arterial walls are weak and relaxed and the blood is poor in fibrin, and in such cases the severing of even such small vessels as those which supply the teeth are likely to cause severe hemorrhage.

The author defines hemophilia as an abnormal state characterized by a marked tendency to hemorrhage, owing to a diminished resistance of the walls of the bloodvessels and to an insufficient degree of coagulability in the blood. Hemophilia is an hereditary diathesis, as shown by a considerable number of cases on record.

The author recalls the case of a man who died from spontaneous hemorrhage, of whose seventeen descendants five died of hemorrhage following slight traumatism and the remainder were subject through life to continuous hemorrhages from which several of them eventually died. Rush recorded the case of an anemic woman who died from metrorrhagia; she was survived by three daughters, who also died from the same cause. One of the latter had a daughter and two sons; the daughter died from uterine hemorrhage and both sons from epistaxis.

In the hemophiliac the slightest injury will provoke hemorrhage, and even slight blows which do not destroy the continuity of the skin bring about subcutaneous hemorrhage. Epistaxis is the most frequent form of spontaneous hemorrhage in the hemophiliac. The tendency to hemorrhage is not always of the same degree; thus several authors affirm that at the period of dentition the tendency to hemorrhage is greater than at any other period of life, and that the frequency of hemorrhage is greater in the autumn and winter than in the other seasons of the year. Hemophilia is rare in old people, and cases are known of men in whom, although the condition was present when they were young, yet the diathesis disappeared upon their reaching old age. We must state, however, that hemophiliacs seldom reach old age. This diathesis is more frequent in man than in woman.

Dr. Guerini does not touch on the question of treatment, which of course is a matter of great importance to the practitioner of medicine or of dentistry. In cases of persistent hemorrhage full doses of morphin have been recommended, as by slowing the heart's action the flow of blood is apt to be lessened; but as the quantity of the agent that must be given in order to depress the heart is greater than the small average dose usually administered, the danger of the by-effect of morphin precludes to a certain extent the use of this agent. Calcium chlorid, which has been found to possess the property of increasing the coagulability of the blood, has rendered valuable services in the treatment of hemophilia. Given in doses of ten grains thrice daily it has arrested persistent cases of hemorrhage, as shown by C. Edward Wallis (*Journal of*

the *British Dental Association*, August 1902, and *DENTAL COSMOS*, March 1904). Tincture of iron chlorid in cases of hemophilia due to anemia, aconite to reduce circulatory activity, and adrenalin chlorid externally and internally, are a few other agents which may be found useful in the treatment of this diathesis.

[*Nordisk Tandläkare Tidskrift*, Stockholm, January 1904.]

AN ORAL MANIFESTATION OF A CEREBRAL DISORDER. BY DR. CHRISTENSEN.

Dr. Christensen relates the following interesting case: During the early part of the summer of 1903 he was asked to visit a merchant too sick to leave his room. Upon his arrival he learned that the patient about four months previously had had a hemorrhage of the brain, from which, however, he rapidly recovered, and since had attended to his business without any inconvenience.

His physician had suspected some grave systemic disorder of being the cause of the hemorrhage and had prescribed for the patient a mixture of mercury bichlorid and potassium iodid. After a few days of this treatment a number of exceedingly sore ulcers began to appear in various places on the mucous membrane of the mouth, and the physician, thinking that possibly the ulcers were caused by the prescribed medicine, ordered the bichlorid stopped. But the ulcers would not heal. Contrariwise they became larger and more tender, so that the patient suffered excruciating pain in trying to take nourishment. The physician had tried both antiseptic and cauterizing agents without effect.

When Dr. Christensen examined the mouth he found large and very deep ulcers in several places along the gingival margin, but mostly on the soft tissues back of the third molar of the lower jaw and along the lingual gingival margins of the jaw. Here the soft tissues were entirely necrosed, the bone being bare. The ulcers had a dirty yellow appearance, and, in spite of almost constant washing with deodorizing solutions, emitted a most offensive odor, while the pain was so acute that the patient could scarcely move his tongue. No local cause could be found, and Dr. Christensen states that the man had always taken very particular care of his mouth and teeth.

After a period of about fourteen days, during which time nothing was done except thoroughly washing the mouth at short intervals with antiseptic solution, the patient began to experience violent pains in the head, increas-

ing at such an alarming rate that an operation became absolutely necessary, in order, if possible, to secure for the sufferer some relief.

A surgeon was called, and after a consultation trephining was decided upon. The place selected was the point where the pains seemed to originate. Upon opening the skull a brain tumor was discovered, of such size and depth, however, as to preclude removal. The intracranial pressure was so great that quite an amount of brain-tissue and part of the tumor protruded from the opening. As the result, all pain disappeared.

What is particularly interesting for dentists to note is the fact that as soon as the intracranial pressure was relieved the ulcers in the mouth began to heal without further medication, so that after a few days the mouth was in a perfectly healthy condition—showing an intimate relation between the necrosed mucous membrane and the pressure on the brain.

J. E. HEYKE, D.D.S.

[*Le Monde Dentaire*, Paris, February 1904.]

PLASTER MASKS OF THE FACE. BY M.

DELAIR, PROFESSOR AT THE ÉCOLE DENTAIRE, PARIS, FRANCE.

The plaster is mixed with water containing two per cent. potassium sulfate. It is carried to the face in small quantities, and is spread over it by means of the convex side of a spoon. Beginning at the forehead the plaster is gradually made to cover the entire face, but not before having inserted two rubber tubes in the nasal orifices. The plaster hardens quickly and the impression is removed as soon as it sets. The mask is obtained by pouring into the impression a layer of thinly mixed plaster; a second layer of plaster of thicker consistence is then added, and the operation is concluded with very thick plaster, which forms the body of the mask. The entire operation as performed by Professor Delair does not take up over thirty-five minutes.

[*Western Dental Journal*, March 1904.]

NEW METHOD OF FORMING THE MATRIX FOR INLAYS. BY CHARLES CHANNING ALLEN, KANSAS CITY, Mo.

In order to facilitate the forming and removing of a matrix it has been suggested that it be previously filled with some material solid enough to be handled. After trying a number of substances the author began experimenting with gum camphor—the ordinary article procurable at drug stores—and found that it can be packed into the matrix, facilitating its formation, as it has the desirable flow and packs very hard, actually

swaging the matrix to the cavity, and enabling the operator to burnish down the edges until they are smooth and perfectly adapted to the tooth. A small lump of camphor is placed in the cavity and burnished down hard.

If the matrix be difficult of removal, a sharp instrument, such as an explorer, may be inserted in the body of the camphor, and the matrix, camphor and all, with a little care, may be removed from a location where it would be impossible to get a matrix out without distortion unless it were filled. The camphor, when properly placed, comes out hard enough to stand all the handling necessary. After the matrix is removed, you can proceed to invest in asbestos or any compound used for that purpose without fear of disturbing the shape of your matrix. If you are investing, using alcohol, all you have to do is to touch a match to the investment, and by the time the alcohol has burned up the camphor will have absolutely disappeared,

leaving a perfectly clean matrix with no trace of ash or any residue.

[*Western Dental Journal*, March 1904.]

ALUMINUM. BY E. BUMGARDNER.

After referring to the physical and chemical properties of aluminum, the author states that the use of this metal for dental purposes will always be limited on account of its tendency to disintegrate from the action of the alkaline fluids of the mouth, and also because of its lack of elasticity, which renders it unfit as a base for artificial dentures. But the one obstacle that, more than any other, stands in the way of the use of aluminum for dental purposes is the difficulty of soldering it. The author reviews the circumstances which render so difficult the soldering of aluminum, and concludes his paper by recommending the following formula for aluminum solder: Aluminum 60 parts, zinc 10 parts, phosphor-tin 30 parts, and stearic acid as the flux.

PERISCOPE.

Never Use H_2O_2 in Closed Cavities.—Never introduce hydrogen dioxid into a cavity in which pressure would be likely to do damage, unless the opening leading into it is sufficiently large to allow for an immediate escape of the gas formed.—*Internat. Journ. of Surgery*.

Gauze Drains Contra-indicated in Pus Cavities.—Never forget the fact that gauze will drain serum or very fluid discharges, but not pus. Hence the filling up of an abscess cavity with gauze is the surest possible way of blocking-in the secretion and favoring sepsis.—*Internat. Journ. of Surgery*.

Tube and Split-Pin Anchorage for Centrals or Laterals.—When one of the centrals is missing, a tube is placed in the remaining central and the hooked spur in a gold filling in the lateral, just at the basilar ridge. When a central and lateral are lost, a tube is put in the canine and the spur in a filling in the remaining central. It also forms an excellent support where the first bicuspid and lateral incisor are gone, the canine being tubed and spurs from the dum-mies resting in the central incisor and second bicuspid.—FRED. A. PEESO, *Items of Interest*.

Zinc Oxyphosphate: Its Advantages as a Filling Material.—The zinc oxyphosphate cement, as far as adaptation to cavity walls is concerned, is by far the best of any filling materials used by the dentist, and if it were indestructible in the oral fluids and impervious to them it would be the ideal, and the dental profession would need to look no farther for perfection.—H. B. TILESTON, *Dental Summary*.

Care in Applying the Rubber Dam.—I think the average dentist should have the dam applied to his own teeth by some careless man at least once a week. He would then use care in applying it for others. Ordinarily there should be no pain and very little discomfort through its application. In the cold weather, if you will place the clamp in the forceps, and then hold the clamp over your Bunsen burner just long enough to warm it, your patient will bless you. If, in carrying your ligature between the teeth, you are careful not to let it strike the gum suddenly, your patient will appreciate it. If you are about to fill an ordinary cavity, it is absolutely cruel to ligate several teeth, carrying the ligature up above the natural gum line.—F. MILTON SMITH, *Internat. Dental Journal*.

Treatment of a Root Through a Jacket Crown.—The jacket crown being hollow, and having a metal back, provides a ready means of access to the pulp-canal; this is a point in its favor, particularly to those who claim that a crown capped will surely give trouble unless the pulp be devitalized. Using a crown of this description, therefore, will demonstrate pulp-vitality, and when treatment is necessary, lessen its difficulties.—W. A. CAPON, *Dental Brief*.

General Anesthesia Contra-indicated in the Presence of Dyspnea.—In very severe dyspnea general anesthesia is usually contra-indicated, for the reason that it abolishes the activity of the voluntary muscles of respiration, and hence may cause suffocation. In these cases the carbonic acid poisoning is often sufficient to lessen sensibility to a great extent, so that rapid operations can be done with very little pain. Otherwise local anesthesia should be employed.—*Internat. Journ. of Surgery*.

Result of Exposure to Radium.—At a recent meeting of the Academy of Sciences in Paris, Dr. Roux of the Pasteur Institute presented a paper detailing the results of exposing mice continuously to the action of radium. He hung a tube of radium in a cage containing mice, and after twenty days the animals lost their fur, which subsequently came out again, but was white. Exposure for a still longer period resulted in the production of a general muscular paralysis.—*Lancet and Clinic*.

Treatment of Hyperemia and Slight Pulpitis.—Hyperemia and fresh cases of slight local inflammation of the pulp may be reduced with tolerable certainty by judicious use of oil of cloves, thymol, hydro-naphthol, silver nitrate, etc. The latter has proved a very valuable remedy to me in these cases, applied in the form of powder on a pledget of cotton moistened in the oil of cloves or carbolic acid, and sealed in with zinc oxyphosphate. It may be left in the cavity for twenty-four hours, or even longer where the caries has not approached too near the pulp. In two different cases, where the pulps were protected by only a very thin layer of decalcified dentin, I found some months later that they had suffered a painless death, without giving any disturbance whatever. I could not attribute the death with certainty to the action of the silver nitrate, though it is well to avoid an excess in such cases.—W. D. MILLER, *Internat. Dental Journal*.

Action of Adrenalin on the Blood.—M. Loeper and O. Crouzon (*La Tribune Médicale*) find that the ingestion or the injection of adrenalin produces certain effects on the blood, some of which are the following: Hyperglycemia, diminution of the blood ferments, increase first and then diminution of the number of red corpuscles, and lowering of the amount of hemoglobin. The number of the hematoblasts is greatly raised; leucocytosis is, as a rule, very marked, especially when Addison's disease is present, or when the capsule has been removed. This leucocytosis is at first polynuclear, but rapidly becomes lymphoid with slight eosinophilia.

Tooth-powders.—*Journal des Praticiens* for November 11, 1903, advises the use of the following tooth-powder for those suffering from pyorrhea alveolaris:

R—Prepared chalk, 90 gm.
Finely powdered pumice-stone,
Salol, of each, 5 gm.
Peppermint-oil,
Carmine, of each, suff. quant. M.

Sig.—To be used in the morning with a stiff brush, and followed by an antiseptic mouth-wash.

—*New York Med. Journal*.

R—Cretæ præcip.,
Magnes. carb. pond., āā 1 oz.
Pulv. orris rad.,
Sulfur præcip., āā ½ oz.
Otto rosæ, 5 ℥. M.
—*Med. Times and Hosp. Gazette*.

How to Finish Gold Fillings.—Many a young man has wondered why his filling did not finish up like the filling of some excellent operator whose work he has admired. If you see him, tell him that it is not that his ideal operator is so much more skilful than he. It is because he got tired out too soon, and failed to appreciate that all that was needed to make his filling finish perfectly was two or three large pieces of gold, covering the whole surface of the filling like a blanket, carefully laid on with a broad, flat, almost smooth-faced plugger; this to be followed by a very small point with which the surface is condensed. Tell him also for his encouragement that his ideal operator has not skill enough to put a perfect filling in the cavity where he failed yesterday, with no more room than he had. It is not that his ideal is so much more expert as a mechanic; it is that he knows that to fill the cavity perfectly he must have room, and without it he will not attempt the task.—F. MILTON SMITH, *Internat. Dental Journal*.

Advantages of Removable over Fixed Bridge Work.—Of the many advantages which removable bridge work possesses over fixed work, the first to be named is its hygienic properties. No one can deny that a bridge which can be removed from the mouth, cleansed, and sterilized in boiling water, if desirable, is far more cleanly and far less liable to become foul than is one which is permanently fixed, and which can only be cleansed in the mouth. In many cases where fixed bridges are worn the mouth becomes so foul and the breath so offensive as to be almost unbearable, even when the best of care is given them. Another point in favor of removable work is the facility with which it can be repaired in case of accident, and also the ease with which the adjoining teeth can be reached in case of decay or accident.—FRED. A. PEESO, *Items of Interest*.

Desiderata in Pulp-Capping.—Long ago, experience established the fact that the operation, that it may promise success, must fulfill three conditions. They are as follows: First, the material employed must be non-irritating; second, it must not produce pressure upon the organ, for pressure will set up disturbances that will almost surely result in devitalization; third, the covering must be in absolute contact with the organ, for if space exist the pulp will protrude through the opening, and strangulation and death of the organ will result. Where these conditions are met, successes will be many and failures few, in cases such as are now in mind, namely, newly exposed pulps where no pathological conditions have existed. To cap a pulp that has for some time been exposed, and where morbid influences have already begun their work, is simply to court failure, and should not be attempted.—S. H. GUILFORD, *Stomatologist*.

Opening Cavities to Gain Free Access to Root-Canals.—In opening cavities for the treatment of pulps we should not hesitate to freely remove sufficient of the tooth-substance to permit free access to the interior of the cavity, cutting mostly to the cornua of the pulp. This should be the vital point of exposure. In opening the pulp, an instrument with a rather broad cutting surface should be employed, and then in a longitudinal direction with the surface to be exposed. By so doing, proceeding with care, the broad surface will pass gently over the pulp, without being forcibly pressed into the same, and as the reflection of the pulp can be readily seen through the thin lamina of bone intervening, the sharp angle can then

be easily made to raise this thin section without inconvenience to our patients, and with much satisfaction to ourselves. Instruments with rounded cutting surfaces, in my estimation, cannot be advantageously used.—J. F. WERNER, *Dental Summary*.

The Ideal Way of Teaching.—There is but one ideal way of teaching, and that is to study the individuality of your student and teach according to its demands. If I were rich enough I should create a fund for that purpose, and prove to you results such as Froebel has given to the world in his kindergarten system. I never have and never will permit any difference of infirmity practice from my method of didactic teaching. Dentistry is not a very broad profession, but it certainly permits numerous ways of execution. It is utterly impossible, without confusing the minds of beginners, to teach definitely more than one system, and that should be one based on successful and progressive methods. Other operative methods should be alluded to, and teaching should thus be cosmopolitanized, but neither the mind nor the hand of a student should be allowed to wander in all directions without a positive method, which must prove the foundation of all possible future ramifications.—R. H. HOFHEINZ, *Items of Interest*.

Difficulties Attending the Insertion of a Gold Filling in the Approximal Surface of a Tooth Adjoining the Abutment of a Fixed Bridge.—Anyone who has undertaken to insert a gold filling in the approximal surface of a tooth adjoining the abutment of a fixed bridge can appreciate the difficulties of such an operation. It is necessary to get a much greater separation than where no bridge is worn, as the rubber dam cannot be put on over a fixed piece. If the bridge be removable it has simply to be lifted off, the rubber dam adjusted, and there will be ample room to prepare the cavity and insert the filling without further separation; or, if the anchorage be such that there will be no separation on the removal of the piece, the separation can be easily made after the bridge is off, and the dam will include the abutment. Another advantage is that in case of any pathological conditions of the mouth arising which might make it desirable to have the piece out of the mouth for a time, if it be a fixed bridge which the patient is wearing, it will be necessary to cut and mutilate it in removing so as perhaps to destroy it, while a removable bridge can be detached almost in an instant.—FRED. A. PEESO, *Items of Interest*.

Pulp-Protection in Cases of Irritation and Hyperemia.

—When cases present themselves with slight irritation, where no exposure has actually occurred, the cause possibly being the nervous irritability of our patients, or what is generally termed the temperative stage, we are justified in attempting to preserve the same. This is generally accomplished in ways commonly known to all, but one to which I am particularly partial is simply this: After the cavity has been washed with warm water, thoroughly dried, and made aseptic by the use of a solution of carbolic acid, use a small disk of hard gutta-percha, sufficiently large to cover the supposed area; compress the center by the use of a round burnisher, and place these in a small portion of chloro-percha, placing the disk in position and covering with a coating of zinc oxyphosphate, forming a hardened surface upon which to work; a small platinum disk may also be used in the same manner, and especially in smaller cavities is it preferable.—J. F. WERNER, *Dental Summary*.

Sacrificing the Natural Crowns of Teeth for Bridge-work Abutments.

—The practicability of sacrificing the natural crown of a tooth for the purpose of replacing it with an artificial substitute as a means of affording opportunity for the attachment of the tooth to be supplied is always, particularly in early life, and especially because of the probable incomplete development of the root, to be regarded as a serious problem. While it is true that such a procedure will invariably offer a maximum degree of stability in the attachment, and of permanence in the operation, yet in my opinion it is warrantable only in proportion to the accuracy obtained in the adaptation of the artificial crown, and the degree of esthetic perfection achieved in its adjustment. We do know that a good, well-made artificial crown, which has been accurately fitted to a central incisor or canine root, and which is then further provided with a rest against the lingual surface of the adjacent natural crown, to prevent rotation, will carry a lateral in a manner which justifies a prognosis of reasonable permanence. Yet whether this seemingly ruthless destruction of the natural crowns for this purpose, particularly in the mouths of patients of tender years, is warrantable or not, is largely a question which may be determined only by the discretion and good judgment of a conscientious operator.—HART J. GOSLEE, *Items of Interest*.

Local Anesthesia.—F. GREGORY CONNELL, surgeon to St. Vincent's Hospital, Leadville, Col. (*Annals of Surgery*, December 1903), after discussing the unsatisfactory effects of other local anesthetics, particularly commends the use of beta eucain. In a series of over eighty cases in which he used this remedy, it was most effectual and without any untoward results whatever. Beta eucain has for its most characteristic and advantageous features the following: (a) Non-toxicity, the fatal dose being between 6 and 7½ grains per 2½ lbs. of body weight; there is practically no possibility of such a dose being injected in the course of an ordinary anesthesia. (b) It may be sterilized by heat without the loss of any of its properties. (c) It will not deteriorate or decompose with keeping. (d) It will not increase the tendency to hemorrhage to any marked degree; vasomotor paralysis and secondary hemorrhage occur less frequently than with cocain. These points have been most influential in placing beta eucain as the local anesthetic of choice, and its use is being rapidly increased.

Radio-Activity and the Production of Helium.

—As a matter of fact, the most remarkable property of radium would probably have escaped observation had not helium been discovered and its properties made known. The energy manifested by radium is not due to radium at all, but to the radio-active emanation which it produces from itself, and these emanations would appear to be inert gases, perhaps argon or members of the argon group. The fact that helium was found in minerals containing uranium suggested that helium might be connected in some way with radio-activity. Eventually Sir William Ramsay and Mr. Frederic Soddy showed that though the fresh emanations from radium did not exhibit the spectrum of helium, yet, as the radio-activity dies down, helium is produced in small but ever-increasing quantities. Helium would thus appear to have been born, so to speak, out of the emanations. Are these emanations related closely to the primordial matter, out of which all the elements known to chemistry by process of ages have been elaborated? We are thus brought face to face with the old theory of transmutation, and a fresh light is thrown upon the genesis of the elements. Nature would seem to abhor elements of high atomic weight, and her tendency is to resolve them gradually into elements of lower atomic weight.—*Lancet*.

Posts as Aids in Retaining Fillings.—

When the pulp of an anterior tooth is dead, as we occasionally find, a post may be set firmly into the root, extending into the cavity far enough, by building our gold firmly around it, to give exceptionally strong anchorage. The incisal anchorage, of course, is not much needed; every dentist knows that, but he does not always comprehend or realize that the post must be a firm fixture in the root, or it is not of much good. It must fit against the walls of the root, and not depend alone on cement to hold it in. It must be fitted to hold firmly without cement. Screwing is not necessary, but may be firmer; but if the part extending into the cavity is threaded it takes pretty careful painstaking work to pack gold closely around it, and the gold must be firm there, or if not well condensed the filling may be made to yield without any yielding of the post; hence the post in such a case is of little value. The author prefers a post smooth at that point, for the reason that the plugger points may slide along its sides in placing the gold, and condense it very hard close up to it. The pin should be very firm in the filling as well as in the root.—R. B. TULLER, *Amer. Dental Journal*.

Abutment for Bridge to Replace Bicus-

pids.—Where the bicuspid has been lost, the writer has for many years made use of the split pin and tube, with the hooked spur resting in a filling in the molar. The canine is devitalized and the canal enlarged to the size of the tube to be used. The split pin is made and bent in the desired form, and, with the tube, is placed in position in the tooth, the impression and bite taken, and the bridge constructed. When it is completed, a little wax is put around the pin at the entrance of the tube to prevent any cement from working into it, and the piece is cemented. When the cement has hardened the bridge is removed, the rubber dam adjusted, and after a little of the cement has been cut away from around the end of the tube, a tightly-fitting polished steel mandrel is inserted and a gold filling packed tightly into the cavity around the pin and over the end of the tube, thus perfectly sealing it in, so that there is no possibility of the cement washing away. The pin is then removed and the filling finished and polished. This makes a serviceable attachment, and it has also been used many times in restoring upper central or lateral incisors which have been lost, and even when all of the incisors were gone, by using both of the canines.—FRED. A. PEESO, *Items of Interest*.

Adrenalin in Local Anesthesia.—BRAUN

(*Centralblatt für Chirurgie*, 1903, No. 38) states that the two most important points to be considered in the use of adrenalin for this purpose are the dose and the danger of secondary hemorrhage. As regards the dose, such a very powerful drug as it is should only be used with great care. A dose of 1 mgm. is entirely too large to be subcutaneously injected. In one case an injection of 20 cc. of a 0.5 per cent. solution of eucaïn B, with 10 drops of the 1:1000 adrenalin solution, caused vomiting and prostration, which lasted for an hour; in several other cases this dose caused some cardiac palpitation. Hartwig and others have had some very unfavorable symptoms from this dose, and Enderlen has reported a case where the injection of 8 cgm. of cocain, with 8 drops of adrenalin solution, was followed by a fatal result. The best solution would seem to be one composed of hydrochloric acid 0.2, sodium chlorid 0.8, distilled water 100 parts. Then 10 cc. of this mixture should be placed in a test tube and heated to the boiling-point, and then 1 cgm. of adrenalin added and the solution again boiled. This will give a colorless solution in which the greater part of the salt is neutralized by the adrenalin. Carbolic acid 2 drops should be added, and then the fluid should be kept in bottles holding from 3 cc. to 5 cc. This solution will keep indefinitely. As regards hemorrhage, it is apparent that the anemia resulting from the use of adrenalin is not followed by hyperemia or tissue paralysis, and it is not possible to secure accurate hemostasis in the presence of adrenalin; care should therefore be taken to use a very small dose of adrenalin. This markedly intensifies the duration and degree, with the proper control of any bleeding that may occur.—*Amer. Journ. of the Med. Sciences*.

Advantages of Ethyl Chlorid as a General Anesthetic.—

(1) It is a pleasant anesthetic to inhale, extremely rapid in action, very portable, and inexpensive. (2) It compares favorably with nitrous oxid as regards induction of anesthesia and available period; it produces no cyanosis when used in suitable doses, and necessitates the carrying of no heavy and cumbersome impedimenta. The advantage of this to the general practitioner and dentist in the country is obvious. (3) The technique of the administration is very simple. (4) While not as safe as nitrous oxid in the hands of the unskilled, we are justified in concluding from the material available that it is safer than ether, all

things considered, and much safer than CHCl_3 or ethyl bromid. (5) It can be safely readministered at one sitting, this being a further point in its favor over ethyl bromid. (6) It is not usually followed by marked after-effects. (7) It is preferable to nitrous oxid when the patient is very young, very old, or anemic, while those who are suffering from cardiac, renal, or lung affections take it quite well. (8) It is in no way to be preferred to CHCl_3 or ether for prolonged anesthesia, but may be used with advantage merely to induce anesthesia which is maintained either with CHCl_3 or ether. (9) For minor surgery, throat operations, and the extraction of teeth, it is the best anesthetic available at the present time. (10) Pure ethyl chlorid, sold as such, is always preferable to proprietary preparations and to mixtures such as somnoform. (11) In conclusion, I think one of the strongest claims of ethyl chlorid to being a fairly safe anesthetic lies in the fact that during the past twelve months it has been experimented with wholesale throughout the country, and yet no death has been recorded. I think it is quite possible that we may hear of one or two from time to time now, as the anesthetic becomes more widely used, and often by quite unskilled and inexperienced persons, but that should not blind us to the real merits of the drug when used with reasonable precautions. —DR. LUKE, *Dental Record*.

"Diseases of Metals."—In *Harper's Monthly* for April, Prof. E. Heyn writes thus on "Life and Diseases of Metals": "Many metals show symptoms of poisoning, rendering them unfit for use. Thus steel can, by means of small quantities of hydrogen and under certain circumstances, be very seriously affected. Let us take two steel bars of the same material, both heated to a red heat, one surrounded by air, the other exposed to the influence of hydrogen; chilling both bars in water after heating, we shall find the bar heated in hydrogen to be brittle, whereas the other bar, heated in air, will turn out to be far superior. The hydrogen has in this instance acted like poison upon the heated steel, and very small quantities of such poisonous matter will suffice to produce very violent effects. The disease in question can be radically cured, it being only necessary to anneal the poisoned bar, repeating the process by heating it exposed to air. Indeed, the poisoned steel, if allowed to lie for a long time, will without any further expert treatment show signs of improvement to a certain degree, the poison gradually leaving it. A better treatment still is boiling in

water or oil—which process may be compared to using warm compresses in the case of human beings. Metals can become diseased from improper treatment—as, for instance, copper and steel when exposed a certain length of time to temperatures exceeding fixed limits. The copper loses in consequence a great part of its ductility and bending qualities; in steel the disease can become so virulent that a steel bar so infected may, on falling to the ground, break to pieces. The technical expert calls such disease 'overheating.'"

[The above quotation may be of interest to the dental profession as having a direct bearing upon platinum. In this connection we quote also from a communication received from The S. S. White Dental Manufacturing Co., which is valuable as representing expert opinion in regard to the behavior of that metal under certain conditions. It is as follows: "We have occasionally had complaints of platinum tooth-pins being brittle. In every case the history of which we were able to trace it was found that they had been subjected to soldering. It is a well-known fact that some of the base metals have the power of "poisoning" or producing "disease" in platinum when brought into contact with it. At a heat far less than that of the fusing-point of platinum, crystallization ensues and the pins become brittle. There is reason to believe that carbon in combustion has under certain conditions a similar effect upon platinum. It is therefore important that dentists in soldering platinum pins should exercise the utmost care, and should be sure that the solder and flux employed are as free as possible from injurious substances."—Ed.]

Crowning a Split Root.—The promiscuous use of crowns having excessively large pins has been the cause of much serious trouble through the splitting of the roots in which they have been cemented. This generally leads eventually either to the mutilation of adjoining teeth to make abutments for some bridge arrangement, or to the compulsory use of a plate—either expedient being a legitimate cause for concern to the patient. Using the jacket crown in some cases of that kind is practical, especially if the root is only slightly cracked and the damage has been discovered before the fissure has been forced open sufficiently for the gum to penetrate. The mode of procedure is simple and without complications. Draw the fractured edges together by twisting a fine platinum wire around the end of the root, forcing the wire well under the gum, after which the canal is enlarged and is extended to the solid end.

If the fracture is central throughout, these directions cannot apply. The root is drilled and capped, and a How screw-post dipped in thin cement is gently turned to its place. While the cement is soft, pack amalgam about the projecting end of the screw, and allow it to harden. The ends of the platinum wire are cut closely, and bent against the side of the root, thereby lessening irritation to the gums or lips, and the patient is dismissed with the usual precautionary advice. At the next sitting the wire is cut, and as it gives the correct circumference of the root it can be used as a measurement in making the crown. This is an accurate description of work of this kind done by me in several instances. In each case the result has been sufficiently lasting to pay for the effort. In one case a second bicuspid was preserved in this manner in active service for eight years, and would have had a longer life but that it had no support on the molar side, that tooth having been lost.

Frequently roots have been condemned because the canal has been enlarged to such an extent that an ordinary pin crown has no chance for permanent retention. This condition often results from a frequent loosening of the crown, the canal being enlarged at each resetting until it becomes useless, or is generally considered so. The insertion of a post and the addition of amalgam, making a foundation, is a method which can be used in almost every instance where such conditions exist. The same directions apply also to a root that has decayed considerably, leaving a thin edge at the gum line, and having insufficient strength for any pin crown. Treated in this manner such roots will give satisfaction and often develop surprising strength and durability. I recall one case in which four incisor roots in one mouth were treated in this manner over thirteen years ago, and they are now strong and healthy where they were loose and decayed, because in giving them length for contact they became normal in condition. The patient is credited with having fine-looking teeth, and yet the roots had been considered beyond the pale of salvation and condemned to extraction.—W. A. CAPON, *Dental Brief*.

The Fear of the Anesthetic.—The fear of an operation in the days before the advent of anesthetics was a piteous and a dangerous thing, since instances were noted in which it actually caused death even before the surgeon had begun his work. It is fortunate that this has been eliminated, and that we now see this fear enormously lessened. Yet it exists still in some degree, and is at times complicated by dread of the anesthesia. How

much practical importance is to be ascribed to the latter is a rather difficult question to answer. We must remember that while many patients manifest a more or less intense fear of the anesthetic, it is often only because the narcosis is a preliminary to the operation. It is the starting-point of an experience that is dreaded, and the whole of which is tinged with hateful and uncanny thoughts; it is the gateway through which pours out the flood of the patient's nervous and fearsome expectations. Hence tears, struggles, prayers, resistance, may follow one another until unconsciousness draws its veil over the scene. Fear of the anesthetic, we are persuaded, is much less marked, as a rule, when the operation is to be a comparatively trivial one, and this, of course, tends to show that it is rather the knife than the anesthetic that is feared. Another important element, however, lies in the fact that the patient may have heard someone express himself in regard to the disagreeableness of the procedure. There is but too much ground for this. Ether, as often given by somewhat inexperienced hands and according to the methods generally in vogue but a few years ago, could awaken but feelings of detestation in the mind of the average patient. The modern method of combining nitrous oxid with ether is so much less disagreeable, and the first of these, through its common employment in dental practice, is so generally known to be a not unpleasant substance to inhale, that patients are much more easily prevailed upon to submit to its being used. The importance of careful and skilled anesthesia is now so well recognized that a class of specialists in its administration has been evolved, and surgeons everywhere are congratulating themselves upon this very useful and valuable addition to their facilities. More agreeable anticipations in regard to narcosis will certainly diminish the dread in which it is held, and yet this will not entirely vanish. The nervous and the excitable and unreasonable we shall always have with us. It behooves us to watch for these, and to adopt some precautionary measures. Operating early in the morning is one of the best, since the patient does not then have the greater part of the day to worry in. The administration of something that will blunt the sensorium to some extent is often most valuable. Small doses of morphin hypodermically, or codein by the mouth, are often most successful in their action, and in our opinion every operative case should show good cause why they should not be used, to justify us from withholding them, especially in nervous patients.—*Internat. Journ. of Surgery*.

HINTS, QUERIES, AND COMMENTS.

HEAT IN CONNECTION WITH THE USE OF THE ESSENTIAL OILS AND VOLATILIZABLE AGENTS.

It is the usual practice with many operators when using the essential oils for the purpose of relieving sensitive dentin or to disinfect cavities of decay or root-canals, to follow the application with a stream of hot air in order to "drive the agent into the tissues," as frequently stated by those unmindful of the effect of heat upon the volatile oils under the circumstances here described.

The essential or volatile oils are agents which volatilize at ordinary temperature or upon the application of even a slight degree of heat, the vapors escaping in the direction of least resistance. Heat hastens volatilization, and when a current of warm air is directed into a cavity wherein a dressing consisting of an essential oil has been inserted, the oil volatilizes, and the vapor escapes through the widest opening. In the case of carious cavities and root-canals, if the volatilization of the oil be hastened by warm air a very insignificant amount will be absorbed into the substance of the dentin, and the result will be less satisfactory than if the agent had been allowed to volatilize spontaneously.

For these reasons the writer is of the opinion that the application of essential oils or of volatilizable agents should be preceded by thorough dehydration of the hard dental tissues by means of alcohol and by currents of warm air from a suitable syringe in order to facilitate absorption—for, as is well known, desiccated tissues will absorb liquid agents more readily than those which have not been submitted to the dehydrating process.

From the foregoing axiomatic considerations it naturally follows that the use of heat after the oils have been carried into the tooth is not only useless but is detrimental, inasmuch as the effect of the application is necessarily diminished in proportion to the amount of oil volatilized from the cavity.

JULIO ENDELMAN.

A CASE OF NECROSIS OF THE INFERIOR MAXILLA.

JOHN W., private, Troop "L," 2d U. S. Cavalry, age thirty; white; reported October 30, 1903, with dento-alveolar abscess about the region of the lower left first molar, which had been fractured below the alveolar border in an attempt to extract the tooth; this occurred while the patient was *en route* between West Point, Ky., and Fort Sheridan, Ill., on or about October 24, 1903.

With the aid of a screw extractor the posterior root was removed, and the gangrenous tissue treated until November 4th, when the anterior root was with difficulty removed. Great swelling of the soft parts had up to this time rendered the removal of this root almost impossible. Antiseptic washes were given.

November 8th. The diagnosis was changed to necrosis, and the lower left second molar, the alveolus of which had become badly affected, was removed, and the antiseptic treatment continued, the patient being seen daily and the parts dressed.

12th. The edges of the wound were freshened and all sharp edges of the alveolus trimmed. Sulfuric acid was applied to the bottom of the socket with a cotton swab, and neutralized with sodium bicarbonate.

14th. Patient confined in hospital and medical officer called in consultation. The medical officer concurred in the plan of treatment.

15th. Internal incision one inch long was made buccally to alveolar process and carried down to the depth of a little over an inch. Tonics were given in the form of tincture of iron chlorid and quinin sulfate.

16th. Patient complained of not sleeping, so morphin 0.015 gm. was given on this night. Hot flaxseed poultices were applied for one-half hour at night, preparatory to making external incision on the following day.

17th. Under cocain anesthesia an external incision one inch long was made under the

lower border of the inferior maxilla, midway between the angle and the symphysis. Groove retractor was passed well into the affected area and drainage placed. The wound was dressed, and a mouth-wash of fifty per cent. hydrozone given. But very little pus was drawn by means of this incision.

18th. The drain was removed and the wound irrigated with fifty per cent. hydrozone and the drain replaced. Temperature 101°.

19th. Same treatment. The swelling was slightly reduced, and a little more pus was drawn than on the previous day. Temperature 99½°.

20th. Lower left first bicuspid was found to be badly affected and greatly annoying the patient, so it was extracted. The root of this tooth was entirely denuded of its pericementum with the exception of a very narrow border at the neck. The treatment as to washes, dressing, and tonics was continued. A slight amount of pus was obtained. The swelling was reduced a little.

Note that this left the second bicuspid standing alone in the diseased area. It was hoped to save this tooth for a bridge abutment.

25th. Patient gaining strength, feeling better, and looking more cheerful. The swelling, which had always been quite hard, was now greatly reduced.

28th. The lower left second bicuspid was found to be badly affected and annoying the patient. It was ordered extracted. The condition of the root was found to be same as that of the first bicuspid, except that it was very tortuous.

30th. Sequestrum formed. An operation for the removal of the same was determined on for the morrow.

December 1st. Under chloroform anesthesia the entire alveolar process from the canine to the third molar was removed from the inferior left maxilla, and all exposed edges of the body of the maxilla well curetted. Hemorrhage was rather profuse, but practically there was no discharge of pus. The external incision was opened freely, and the drain replaced. The wound in the mouth was packed with aseptic gauze, and the fifty per cent. hydrozone wash continued.

3d. Patient feeling much better, with practically no discharge of pus; the gauze pack-

ing was removed and not replaced. (This packing has been renewed three times since the operation.)

4th. Telegraphic orders compelled me to leave this station on this date.

11th. Addressed a letter to the surgeon, Fort Sheridan, inquiring into the condition of this patient, and under date of December 12th received the information that "The above-mentioned soldier has been returned to duty, and with the condition of the jaw rapidly improving. No further necrosis."

Eight days later this soldier had so far recovered as to be permitted to leave with his regiment for the Philippine Islands.

Note.—I took occasion to preserve the sequestrum, which has proved an interesting specimen, inasmuch as it gives an excellent opportunity to observe the manner in which the tooth-sockets end above the line of junction of the cancellous with the compact tissue of this maxilla.

WM. C. FISHER,
Dental Surgeon, U. S. A.

FT. BRADY, MICH.

COMBINATION LOWER PLATES.

MUCH inconvenience is often experienced by patients wearing partial lower dentures where part of the anterior teeth remain, because of the bulk of rubber that is of necessity used to give strength to the arch of the plate which holds the two lateral portions of the plate in position, and passes back of the anterior teeth. This can be overcome to a great extent by building the anterior portion of the plate with medium or large sized platino-iridium wire such as is commonly used for posts. In wire of this kind there is sufficient rigidity to hold the lateral portions of the plate—which is of vulcanite—in their positions. This method, while not original with me, has given me satisfactory results.

Take the medium or large sized platino-iridium wire; not platinum wire, because it has not the strength that platino-iridium wire has. Begin on one side by flattening about half an inch of the end of the wire, notching or roughening it; start to fit the wire to the plaster model about half or three-fourths of an inch back of the place where the last of

the patient's teeth are and the vulcanite is to begin. Let the wire lie directly over the alveolar ridge, but a little above it. Run it up to the last of the patient's teeth, and bend it in around this tooth as you would fit the vulcanite plate at this place around the neck of the tooth. Let the wire follow the general outline of the teeth till you reach the last tooth on the opposite side, around which you should fit the wire so that it closely approximates the neck of the tooth to the middle of the distal surface. Then run it back over the alveolar ridge, flatten, and roughen as before described.

If clasps are desired you can fit them, place them on the model with the wire in position, wax, remove, invest, and solder. When the wire and clasps (if the plate is

to have clasps) are soldered and in position on the model, wax it up as you would any vulcanite plate, leaving out the bridge of wax behind the anterior teeth which would afterward be substituted by vulcanite.

When waxing up your case, do it so that the ends of the wire are invested well in the wax. In making plates in this way you do away with the liability of the plates being broken at the arch at some future time, and also have the advantage of less bulk, less weight, and fully as much strength.

The wire should be so fitted that it just clears the gum back of the anterior teeth, as pressure here would result in irritation and an uncomfortable feeling.

RAYMOND C. MATHIS.

LOS ANGELES, CAL.

OBITUARY.

DR. ISRAEL P. WILSON.

DIED, at his home in Burlington, Iowa, March 9, 1904, from myocarditis, ISRAEL P. WILSON, M.D., D.D.S.

Dr. Wilson was of Scotch-Irish and English descent. He was born in Mount Pleasant, Jefferson county, Ohio, in 1837. He received a common-school education, then went for one year to the Union School at Tipton, Iowa, and later took a special course at Hopedale College in Ohio. He taught school for three years in Iowa and for two years in Ohio. He studied dentistry under Dr. N. H. Tullows of Iowa City, and graduated from the Missouri Dental College in 1869.

For thirty-five years Dr. Wilson was an active member of the Iowa State Dental Society, and at different times held the offices of president and secretary of that organization. He was a member of the American Dental Association, and of the committee of three appointed by the Iowa State Dental Society to study dental legislation in that state. This committee secured the passage of the present law regulating the practice of dentistry in Iowa. He was also one of the committee appointed by the same society which went before the board of regents of the State University, and secured the establish-

ment of a dental department connected with that institution.

For fifteen years Dr. Wilson was lecturer on dental surgery in the medical department of the State University, and for six years was professor of regional anatomy and dental histology in the dental department. For more than a quarter of a century he had been a regular contributor to dental literature through the columns of the dental journals.

At a meeting of the Burlington dentists, held in Dr. Cochran's office in consideration of the death of Dr. I. P. Wilson, the following preamble and resolutions were passed:

Whereas, The dental profession of Burlington, in common with all citizens, mourn their loss in the death of Dr. I. P. Wilson, a citizen who was beyond reproach and a man devoted to his profession, always ready and willing to give his time and ability to the advancement of science, a close student, and a man whose daily application to his work in hand was conscientious, true, and skilful. It is with pride that we, the dentists of Burlington, can look upon his life as a life well spent, and can truly say regarding his efforts: "Well done: thy reward shall be peace." Therefore be it

RESOLVED, That in Dr. Wilson's death the

dental profession has sustained an irreparable loss, and the city of Burlington has lost an honest, conscientious, and perfectly trustworthy practitioner. While our hearts are bowed down with sorrow, yet it will be our pleasure to remember his many virtues and qualifications as a teacher and practitioner.

RESOLVED, That we, his fellow laborers, hereby extend to the sorrowing widow and members of our deceased brother's family our profound sympathy and condolence.

RESOLVED, That the secretary of this meeting be instructed to mail a copy of these proceedings to his family.

R. L. COCHREAN,
O. H. DENISE,
A. W. DANA,
Committee.

JAMES SMITH TURNER, M.R.C.S., L.D.S.

DIED, February 22, 1904, in London, England, at the age of seventy-two, Mr. JAMES SMITH TURNER.

(An extended notice of the deceased will appear in our next issue, embodying the most important features of a useful life full of devotion to the dental profession, for the uplifting of which he labored so hard and accomplished so much.)

DR. CHARLES EBENEZER DEARBORN.

DIED, at his residence in Newton, Mass., after a long illness, Dr. CHARLES EBENEZER DEARBORN.

The subject of this sketch was the son of Ebenezer and Hannah (Dyson) Dearborn, and was born in Nashua, N. H., February 28, 1820. He was educated in the Nashua Academy and at Dartmouth College, being graduated in 1842. He came to Boston that year, and for a short time taught school in Yarmouth. A few months later he studied medicine and dentistry under Dr. Willard W. Codman, on Boylston street. He practiced dentistry with Dr. Daniel Harwood for ten years, then with Dr. David M. Parker for thirty-five years. Their offices were first located on Summer street, but later they removed to Boylston street, where they remained for many years. Dr. Dearborn numbered among his patients some of the best-known people of the city. He retired over two years ago.

He was a member of the Dartmouth Club of Boston, and one of the oldest alumni of Dartmouth College.

Dr. Dearborn married, April 30, 1857, Miss Caroline M. Lawrence of Pepperell, who died some years ago. Two sons, Edward E. Dearborn of Shelburne, Vt., and Henry M. Dearborn of Philadelphia, survive him.

DR. HENRY C. GILL.

DIED, at Rockford, Ill., April 4, 1904, Dr. HENRY C. GILL, aged fifty-nine years.

Dr. Gill's death was very sudden, and occurred in his laboratory just after he had returned from luncheon. This event following closely upon the similar death of Dr. I. P. Wilson of Burlington, Iowa, the dental profession of the West is thus called upon to mourn the loss of two of its ablest and most respected members.

He was born June 4, 1844, at Woodstock, Vt., and there his preliminary education was received. His early life up to manhood was spent on the farm of his father. His connection with the dental profession began with his entrance as a student in the office of Dr. Palmer of Fitchburg, Mass., in 1866, and he remained there for two years. After a short period of practice in Massachusetts he removed to the West, locating first in 1869 at Freeport, Ill., where he resided until 1875, when he removed to Rockford, Ill., to associate in practice with Dr. Noyes E. Babcock of that city. This connection was continued until March 1878, when Dr. Babcock's interest was assumed by Dr. Gill's brother, Dr. Frank C. Gill, who survives him.

He was married September 14, 1871, to Miss Ida C. Bunker, now his widow. One son, Harry, of Cincinnati, O., also survives him.

In Dr. Gill a successful practitioner, a respected citizen, and a genial companion has passed away.

"IN MEMORIAM" RESOLUTIONS.

Dr. Otis Avery.

THE Lackawanna-Luzerne Dental Society, at a regular meeting held March 15, 1904, adopted the following resolutions upon the death of Dr. Otis Avery, an honored and respected resident of Honesdale, Pa., and also an honored member of the dental profession

for more than seventy years, and who recently passed away in his ninety-sixth year:

Whereas, It has pleased the Divine Ruler to remove from this life Dr. Otis Avery, who passed to the great beyond on February 22, 1904; and

Whereas, The dental profession recognizes the benefits received through his having lived, and by his life having given us an example of a true, courteous, professional gentleman; therefore be it

RESOLVED, That in the death of Dr. Avery our profession has lost a man of sterling

worth, whose progress in the profession was a source of pride to his colleagues, and for whose example we return thanks to the Divine Ruler; also be it

RESOLVED, That we condole with his bereaved family, and that a copy of these resolutions be sent to his widow, and to the dental journals, and also be inscribed on our official records.

C. S. BECK,
W. A. SPENCER,
E. J. DONNEGAN,
Committee.

SOCIETY NOTES AND ANNOUNCEMENTS.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization Dental Congress.

H. J. BURKHART, Chairman,
Batavia, N. Y.

E. C. KIRK, Secretary,
Lock Box 1615, Philadelphia, Pa.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer, 1420 Chestnut st., Philadelphia, Pa.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen, 1005 Sutter st., San Francisco, Cal.
- IV. Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.
- VI. Orthodontia. Chairman, E. H. Angle, 1023 N. Grand ave., St. Louis, Mo.
- VII. Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.
- VIII. Prosthesis. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.

IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy, Marshall Field Bldg., Chicago, Ill.

X. Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Committees.

Following are the committees appointed:

Finance. Chairman, C. S. Butler, 680 Main st., Buffalo, N. Y.

Program. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Exhibits. Chairman, D. M. Gallie, 100 State st., Chicago, Ill.

Transportation. (To be appointed.)

Reception. Chairman, B. Holly Smith, 1007 Madison ave., Baltimore, Md.

Registration. Chairman, B. L. Thorpe, 3666 Olive st., St. Louis, Mo.

Printing and Publication. Chairman, W. E. Boardman, 184 Boylston st., Boston, Mass.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey, 524 Penn ave., Pittsburg, Pa.

Dental Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel, 527½ Church st., Nashville, Tenn.

Membership. Chairman, J. D. Patterson, Keith and Perry Bldg., Kansas City, Mo.

Educational Methods. Chairman, T. W. Brophy, Marshall Field Bldg., Chicago, Ill.

Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

Prosthetic Dentistry. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.

Local Committee of Arrangements and Reception. Chairman, Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Essays. Chairman, Wilbur F. Litch, 1500 Locust st., Philadelphia, Pa.

History of Dentistry. Chairman, Wm. H. Trueman, 900 Spruce st., Philadelphia, Pa.

Nomenclature. Chairman, A. H. Thompson, 720 Kansas ave., Topeka, Kans.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally, 1018 14th st., N. W., Washington, D. C.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown, 175 Newbury st., Boston, Mass.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.

Prize Essays. Chairman, James Truman, 4505 Chester ave., Philadelphia, Pa.

Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.

Resolutions. Chairman, J. Y. Crawford, Jackson Bldg., Nashville, Tenn.

Clinics. Chairman, J. P. Gray, 212 N. Spruce st., Nashville, Tenn.

Nominations. Chairman, A. H. Peck, 92 State st., Chicago, Ill. W. E. Boardman, 184 Boylston st., Boston, Mass. M. R. Windhorst, 3518 Morgan st., St. Louis, Mo. Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Ad Interim. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

The officers of the Congress, president, vice-presidents, secretary, and treasurer, will be elected by the Congress at large at the time of the meeting, and will be nominated by the Nominating Committee.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to

act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.

DAVID R. FRANCIS, *President of Exposition*.

Fourth International Dental Congress.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

J. A. LIBBEY, *Chairman*,
524 Penn Avenue, Pittsburg, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing membership as prescribed by the Committee on Membership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of dentistry*. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state chairman, whose indorsement is a cer-

tification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the committee earnestly appeals to each eligible practitioner in the United States who is interested in the success of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are—

State Chairmen.

General Chairman.

J. A. LIBBEY, 524 Penn Ave., Pittsburg, Pa.

States.

Alabama. H. CLAY HASSELL, Tuscaloosa.

Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.

California. J. L. PEASE, 1016 Clay St., Oakland.

Colorado. H. A. FYNN, 500 California Bldg., Denver.

Connecticut. HENRY McMANUS, 80 Pratt St., Hartford.

Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.

District of Columbia. W. N. COGAN, The Sherman, Washington.

Florida. W. G. MASON, Tampa.

Georgia. H. H. JOHNSON, Macon.
 Hawaii. M. E. GROSSMAN, Box 744, Honolulu.
 Idaho. J. B. BURNS, Payette.
 Illinois. J. E. HINKINS, 131 E. 53d St., Chicago.
 Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.
 Iowa. W. R. CLACK, Clear Lake.
 Kansas. G. A. ESTERLY, Lawrence.
 Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.
 Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.
 Maine. H. A. KELLEY, 609 Congress St., Portland.
 Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.
 Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.
 Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.
 Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.
 Mississippi. W. R. WRIGHT, Jackson.
 Missouri. J. W. HULL, Altman Bldg., Kansas City.
 Montana. G. E. LONGEWAY, Great Falls.
 Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.
 New Hampshire. E. C. BLAISDELL, Portsmouth.
 New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.
 New York. B. C. NASH, 142 W. 78th St., New York City.
 North Carolina. C. L. ALEXANDER, Charlotte.
 Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.
 Oklahoma. T. P. BRINGHURST, Shawnee.
 Oregon. S. J. BARBER, Macleay Bldg., Portland.
 Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.
 Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.
 South Carolina. J. T. CALVERT, Spartanburg.
 South Dakota. E. S. O'NEIL, Canton.
 Tennessee. W. P. SIMS, Jackson Bldg., Nashville.
 Texas. J. G. FIFE, Dallas.
 Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.

Vermont. S. D. HODGE, Burlington.
 Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.
 Washington. G. W. STRYKER, Everett.
 West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.
 Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.

For the Committee of Organization,

EDWARD C. KIRK, *Secretary*.

Fourth International Dental Congress.

MEETING OF THE COMMITTEE OF ORGANIZATION.

At a meeting of the Committee of Organization of the Fourth International Dental Congress held in St. Louis, Mo., April 9, 1904, the following action was taken:

In accordance with the understanding at the last meeting of the committee, held at Washington, D. C., February 23, 1904, that a Nominating Committee for the purpose of nominating officers for the Fourth International Dental Congress be elected at the next meeting of the committee,

Dr. M. F. Finley made the following motion:

"That a Committee on Nominations be elected at this time for the purpose of proposing names for the officers of this Congress, and that Drs. A. H. Peck and W. E. Boardman, representing the Committee of the National Dental Association, and Drs. M. R. Windhorst and Wm. Conrad, representing the Committee of the Fédération Dentaire Internationale, be constituted the Committee on Nominations, to present nominations for the officers of the Fourth International Dental Congress, and that said nominations be presented at the present meeting of the Committee of Organization."

The motion was unanimously carried, and Drs. A. H. Peck, W. E. Boardman, M. R. Windhorst, and Wm. Conrad were elected as the members of the Nominating Committee.

At a subsequent session the Nominating Committee presented the following report:

"Your committee begs to report the following nominations for officers of the Fourth International Dental Congress:

"President—H. J. Burkhart, Batavia, N. Y.

"Honorary Presidents—James Truman, Philadelphia, Pa. A. H. Fuller, St. Louis, Mo. G. V. Black, Chicago, Ill. Thomas Fillebrown, Boston, Mass. S. G. Perry, New York, N. Y. Gordon White, Nashville, Tenn. E. T. Darby, Philadelphia, Pa. A. W. Harlan, Chicago, Ill. James McManus, Hartford, Conn. W. W. Walker, New York, N. Y. J. N. Crouse, Chicago, Ill. G. A. Bowman, St. Louis, Mo. H. A. Smith, Cincinnati, O. T. W. Brophy, Chicago, Ill. Wm. Jarvie, Brooklyn, N. Y. Wm. Conrad, St. Louis, Mo. M. R. Windhorst, St. Louis, Mo. S. H. Guilford, Philadelphia, Pa. J. D. Patterson, Kansas City, Mo. C. C. Chittenden, Madison, Wis. Wm. Carr, New York, N. Y. E. H. Smith, Boston, Mass. M. H. Cryer, Philadelphia, Pa. E. A. Bogue, New York, N. Y. V. E. Turner, Raleigh, N. C. A. L. Northrop, New York, N. Y.

"Vice-Presidents—A. H. Thompson, Topeka, Kans. J. G. Reid, Chicago, Ill. George Fields, Detroit, Mich. D. O. M. LeCron, St. Louis, Mo. Garrett Newkirk, Los Angeles, Cal. R. Ottolengui, New York, N. Y. R. M. Sanger, East Orange, N. J. D. N. Rust, Washington, D. C. N. S. Hoff, Ann Arbor, Mich. L. P. Bethel, Columbus, O. Jules J. Sarrazin, New Orleans, La. C. L. Alexander, Charlotte, N. C. C. H. Darby, St. Joseph, Mo. B. C. Nash, New York, N. Y. G. S. Vann, Gadsden, Ala. B. F. Luckey, Paterson, N. J. E. R. Warner, Denver, Colo. Wms. Donnally, Washington, D. C. Frank Holland, Atlanta, Ga. C. A. Meeker, Newark, N. J. W. P. Dickinson, Minneapolis, Minn. E. K. Wedelstaedt, St. Paul, Minn. Adam Flickinger, St. Louis, Mo. V. H. Jackson, New York, N. Y. J. M. Whitney, Honolulu, Hawaii. B. Holly Smith, Baltimore, Md. Louis Ottofy, Manila, P. I. C. M. Gingrich, Baltimore, Md. H. B. Tileston, Louisville, Ky. Wm. Crenshaw, Atlanta, Ga. J. F. Dowsley, Boston, Mass. J. W. David, Corsicana, Texas. Geo. E. Hunt, Indianapolis, Ind.

"Secretary-General—Edward C. Kirk, Philadelphia, Pa.

"Treasurer—M. F. Finley, Washington, D. C.

"Committee to Nominate Honorary Presidents and Vice-Presidents for Foreign Countries—Edward C. Kirk, Philadelphia, Pa. Edward H. Angle, St. Louis, Mo. Wilbur F. Litch, Philadelphia, Pa.

(Signed)

"A. H. PECK,

"WALDO E. BOARDMAN,

"WM. CONRAD,

"M. R. WINDHORST,

"Committee on Nominations."

The above report was adopted by the Committee of Organization subject to ratification by the Congress in general session.

It should be understood that the foregoing list of nominations is necessarily incomplete and subject to future correction and amendment, depending upon individual acceptances and the addition of new names.

EDWARD C. KIRK, *Secretary*
Committee of Organization.

DENTAL SOCIETY MEETINGS: May, June, July, and August 1904.

MAY.

ALABAMA DENTAL ASSOCIATION. Anniston. Beginning May 10th.

CALIFORNIA STATE DENTAL ASSOCIATION. San Francisco. Four days: May 16th to 19th.

FLORIDA STATE DENTAL SOCIETY. Atlantic Beach. Beginning May 25th.

ILLINOIS STATE DENTAL SOCIETY. Peoria. Three days: May 10th to 12th.

INDIANA (EASTERN) DENTAL ASSOCIATION. Richmond. First week in May.

IOWA STATE DENTAL ASSOCIATION. Des Moines. Three days: May 3d to 5th.

KANSAS STATE DENTAL ASSOCIATION. Topeka. Three days: May 12th to 14th.

KENTUCKY STATE DENTAL ASSOCIATION. Louisville. Three days: May 17th to 19th.

MISSISSIPPI VALLEY DENTAL ASSOCIATION. Date not yet announced.

NEW HAMPSHIRE DENTAL SOCIETY. Concord. Two days: May 10th and 11th.

NEW YORK INSTITUTE OF DENTAL TECHNIQUE. New York city. May 13th.

NEW YORK STATE DENTAL SOCIETY. Albany. Two days: May 13th and 14th.

OKLAHOMA DENTAL ASSOCIATION. Shawnee. Three days: May 10th to 12th.

SIXTH DISTRICT DENTAL SOCIETY. STATE OF NEW YORK. Binghamton. Two days: May 5th and 6th.

TENNESSEE STATE DENTAL ASSOCIATION. Jackson. Three days: May 26th to 28th.

TEXAS STATE DENTAL ASSOCIATION. Corsicana. Three days: May 5th to 7th.

WASHINGTON STATE DENTAL SOCIETY. Seattle. Three days: May 26th to 28th.

JUNE.

AMERICAN MEDICAL ASSOCIATION: SECTION ON STOMATOLOGY. Atlantic City. Four days: June 7th to 10th.

GEORGIA STATE DENTAL SOCIETY. Athens. Three days: June 28th to 30th.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: June 14th to 16th.

MASSACHUSETTS DENTAL SOCIETY. Boston. Two days: June 1st and 2d.

MINNESOTA STATE DENTAL ASSOCIATION. St. Paul. Three days: June 16th to 18th.

NORTH CAROLINA STATE DENTAL SOCIETY. Morehead City. Four days: June 29th to July 2d.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. Washington, D. C. June 9th.

NORTHERN OHIO DENTAL ASSOCIATION. Cleveland. Three days: June 7th to 9th.

SOUTHERN WISCONSIN DENTAL ASSOCIATION. Beloit. Two days: June 8th and 9th.

JULY.

MAINE DENTAL SOCIETY. Bangor. Three days: July 19th to 21st.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 21st to 23d.

RED RIVER VALLEY DENTAL SOCIETY. Grand Forks, N. D. July 4th.

WISCONSIN STATE DENTAL SOCIETY. Manitou. Three days: July 19th to 21st.

AUGUST.

FOURTH INTERNATIONAL DENTAL CONGRESS. St. Louis, Mo. Six days: August 29th to September 3d.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. St. Louis. Three days: August 25th to 27th.

State Board Meetings.

ALABAMA BOARD OF DENTAL EXAMINERS. Anniston. May 9th.

ARKANSAS BOARD OF DENTAL EXAMINERS. Little Rock. May 10th to 12th.

CALIFORNIA BOARD OF DENTAL EXAMINERS. San Francisco, May 23d, and Los Angeles, June 13th.

COLORADO BOARD OF DENTAL EXAMINERS. Denver. June 7th to 9th.

DENTAL COMMISSIONERS OF CONNECTICUT. Hartford. May 14th.

ILLINOIS BOARD OF DENTAL EXAMINERS. Chicago. May 6th and 7th.

KANSAS BOARD OF DENTAL EXAMINERS. Topeka. May 9th.

MARYLAND BOARD OF DENTAL EXAMINERS. Baltimore. May 4th and 5th.

MASSACHUSETTS BOARD OF REGISTRATION. Boston. June 22d to 24th.

MICHIGAN BOARD OF DENTAL EXAMINERS. Grand Rapids. May 10th.

MINNESOTA BOARD OF DENTAL EXAMINERS. Minneapolis. June 13th to 15th.

MONTANA BOARD OF DENTAL EXAMINERS. Helena. June 6th, 7th, and 8th.

NEW HAMPSHIRE BOARD OF REGISTRATION. Manchester. June 14th and 15th.

NEW JERSEY BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY. Trenton. July 5th to 7th.

NORTH CAROLINA BOARD OF DENTAL EXAMINERS. Morehead City. June 27th.

OHIO BOARD OF DENTAL EXAMINERS. Columbus. June 28th to 30th.

OKLAHOMA BOARD OF DENTAL EXAMINERS. Shawnee. May 9th and 10th.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS. Philadelphia and Pittsburg. June 8th to 11th.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS. Aberdeen. June 9th.

TENNESSEE BOARD OF DENTAL EXAMINERS. Jackson. May 26th to 28th.

TEXAS BOARD OF DENTAL EXAMINERS. Corsicana. May 9th.

WEST VIRGINIA BOARD OF DENTAL EXAMINERS. Wheeling. June 1st to 3d.

WISCONSIN BOARD OF DENTAL EXAMINERS. Milwaukee. June 1st.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY.

FOLLOWING is the program of the Section on Stomatology, American Medical Association, meeting at Atlantic City, June 7 to 10, 1904:

1. Dental Education: (a) "The Value of Symmetry in the Development of Professional Character and Education" (chairman's address). Geo. F. Eames, Boston, Mass. (b) "The Evolution of Standards in Dental Education," Chas. Chittenden, Madison, Wis. (c) "Phases of Dental Education," A. E. Baldwin, Chicago, Ill. (d) "Dental Education (A Retrospective and Prospective View)," John S. Marshall, San Francisco, Cal.

2. The Dental Pulp: (a) "Neoplasm of the Tooth-pulp," Vida A. Latham, Chicago, Ill. (b) "Vital Principles in Adult Pulp," R. R. Andrews, Cambridge, Mass. (c) "Degeneration of the Tooth-pulp," Eugene S. Talbot, Chicago, Ill. (d) "The Pulp," Jos. Arkövy, Budapest, Hungary.

3. "A System for Surgical Treatment of Hare-lip, Cleft Palate, and Facial Deformities, and Post-Operative Speech Education," Geo. V. I. Brown, Milwaukee, Wis.

4. "Multiple Fracture of Lower Jaw complicated by Simultaneous Fracture of the Upper Jaw," Thos. L. Gilmer, Chicago, Ill.

5. "Impacted Teeth: Their Diagnosis, Liberation, and Extraction," M. H. Cryer, Philadelphia, Pa.

6. "Ankylosis of the Jaw," G. Lenox Curtis, New York city, N. Y.

7. "Necrosis of the Bones of the Face," Stewart L. McCurdy, Pittsburg, Pa.

8. "Treatment of Pathological Irregularities of the Teeth," M. H. Fletcher, Cincinnati, Ohio.

9. "Report of a Case of Vincent's Angina and Stomatitis, with Photographs," Geo. C. Randall, St. Louis, Mo.

10. "Oral Infection and Sterilization," M. L. Rhein, New York city, N. Y.

11. "Concerning Changes in the Salivary Secretions as Affected by Systemic Disease," Heinrich Stern, New York city, N. Y., and Wm. Lederer, New York city, N. Y.

12. "Prophylaxis in Relation to Tooth-Environment and to the Prophylactic Value of Materials Employed," Chas. F. Allan, Newburgh, N. Y.

13. "The Physician's Duty to the Child from a Dental Standpoint," Alice M. Steeves, Boston, Mass.

14. "Ethics," Adelbert H. Peck, Chicago, Ill.
 GEO. F. EAMES, Boston, *Chairman*,
 EUGENE S. TALBOT, Chicago, *Sec'y*.

NEW YORK COLLEGE OF DENTISTRY.

REUNION—CLASS OF '96.

THE anniversary dinner of the class of '96, New York College of Dentistry, will take place on Saturday evening, May 14, 1904, at the Café Martin, Broadway and Twenty-sixth st., New York city.

CHARLES VETTER, *Ch'man*,
 152 Second st., New York, N. Y.

ILLINOIS STATE DENTAL SOCIETY.

THE fortieth annual meeting of the Illinois State Dental Society will be held at Peoria, Tuesday, Wednesday, and Thursday, May 10, 11, and 12, 1904. A splendid program, including attractive and unusually interesting features, is in course of preparation. The usual fare of one and one-third, certificate plan, will be obtained on all roads in the state, and from St. Louis. Remember the date. All reputable practitioners are cordially invited.

HART J. GOSLEE, *Sec'y*, Chicago, Ill.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting of the New York State Dental Society will be held at Hotel Ten Eyck, Albany, N. Y., May 13 and 14, 1904.

Special rates have been secured at the hotels Ten Eyck and The Kenmore; also special railroad rates on the certificate plan with the Trunk Line Association.

The business committee have prepared a most excellent program, and assure to all who attend an unusually instructive and interesting meeting, with essays by the following well-known and prominent men of the profession: "Porcelain," E. N. Jenkins, Dresden, Ger.; Joseph Head, Philadelphia; C. H. Land, Detroit. "Pyorrhea Alveolaris: Its Causes, Sequelæ, and Cure," D. D. Smith, Philadelphia. "Prophylaxis," Geo. E. Hunt, Indianapolis, Ind. "Gold as a Filling Material: Is It Still Important?" B. Holly Smith, Baltimore, Md. (Subject to be announced) W. J. Turner, Brooklyn, N. Y. "Our State Society: A Study and an Appeal," C. W. Stainton, Buffalo, N. Y. "The Pericementum" (with lantern slide demonstration), I. L. M. Waugh. (Subject to be announced) M. H. Cryer, Philadelphia.

Fellow practitioners conversant with the various subjects announced will open the discussions.

Exhibitors desiring space will please address Dr. J. L. Appleton, 89 Columbia st., Albany, N. Y.

R. H. HOFHEINZ, *Pres.*,
 Rochester, N. Y.

W. A. WHITE, *Sec'y*,
 Phelps, N. Y.

OKLAHOMA DENTAL ASSOCIATION.

THE fourteenth annual meeting of the Oklahoma Dental Association will be held at Shawnee, Oklahoma, May 10, 11, and 12, 1904.

THEO. P. BRINGHURST, *Sec'y*, Shawnee, Okla.

FLORIDA STATE DENTAL SOCIETY.

THE twenty-first annual meeting of the Florida State Dental Society will be held at Atlantic Beach, May 25, 1904.

J. EDWARD CHACE, *President*,
D. D. BEEKMAN, *Sec'y*.

SIXTH DISTRICT (N.Y.) DENTAL SOCIETY.

THE thirty-sixth annual meeting of the Sixth District Dental Society of the State of New York will be held at the Hotel Bennett, Binghamton, N. Y., on May 5 and 6, 1904.

The Business Committee is preparing an unusually attractive program of essays and clinics, and a number of exhibitors will be present.

FREDERIC W. MCCALL, *Sec'y*,
Binghamton, N. Y.

NEW YORK INSTITUTE OF DENTAL TECHNIQUE.

THE next regular meeting of the New York Institute of Dental Technique will be held Friday evening, May 13, 1904, at 8 P.M., at "The Chelsea," 222 West 23d st., New York city. The meeting will be preceded by the usual informal dinner, at 6.30 P.M. Covers one dollar.

Dr. E. A. Bogue will be the guest of the evening and will give the address and demonstration. Subject—"Amalgam."

The society is aiming to give at its meetings a series of lectures and demonstrations which will have the value and form of advanced postgraduate work. The series began with the March meeting, when Dr. Bogue gave an interesting and comprehensive lecture and demonstration on "Gold." At the April meeting Dr. Chas. O. Kimball read a paper and demonstrated a method of using "Soft Gold." Dr. Bogue's lecture as above announced will end the series for this season. The plans for

next season comprise a series of lectures and demonstrations given in such order and manner as to form a comprehensive advanced postgraduate course.

Ethical practitioners desiring further information regarding the society may address

F. C. BRUSH, *President*,
1183 Broadway, N. Y.
C. M. HOBLITZELL, *Sec'y*,
478 West 145th st., N. Y.

CALIFORNIA STATE DENTAL ASSOCIATION

AND THE

ALUMNI ASSOCIATION OF THE DENTAL DEPARTMENT, UNIVERSITY OF CALIFORNIA.

THE joint clinics of the California State Dental Association and the Alumni Association of the Dental Department of the University of California will be held May 16 to 19, 1904, in San Francisco.

Dr. Hart J. Goslee, Chicago, will give a series of clinics on "Porcelain." Dr. Henry A. Baker, Boston, will give a series of clinics on "Orthodontia and the Baker Anchorage." A large local clinical program is also being prepared. All the leading dental manufacturers have signified their intention of making an exhibit of their products, and the local dealers will also be represented.

The session is expected to surpass any session previously held in this state.

GUY S. MILBERRY, *Sec'y*,
1202 Sutter st., San Francisco, Cal.

ALABAMA DENTAL ASSOCIATION.

THE Alabama Dental Association will hold its next annual meeting in Anniston, Ala., beginning on the second Tuesday in May, 1904.

L. A. CRUMLEY, *Sec'y*,
First Nat'l Bank B'ld'g, Birmingham, Ala.

NEW HAMPSHIRE DENTAL SOCIETY.

THE New Hampshire Dental Society will hold its annual meeting at Concord, N. H., Tuesday and Wednesday, May 10 and 11, 1904.

All members of the profession are invited to be present.

FRED F. FISHER, *Sec'y*, Manchester, N. H.

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association will hold its twenty-fourth annual session at Corsicana, Texas, May 5, 6, and 7, 1904.

All ethical members of the profession are invited to meet with us.

BUSH JONES, *Sec'y*,
Dallas, Texas.

KENTUCKY STATE DENTAL ASSOCIATION.

THE coming annual meeting of the Kentucky State Dental Association promises a dental convention of unusual interest. To be held in Louisville, May 17, 18, and 19, 1904.

Members of the profession are extended a hearty welcome.

W. M. RANDALL, *Sec'y*,
Masonic Building, Louisville, Ky.

TENNESSEE STATE DENTAL ASSOCIATION.

THE Tennessee State Dental Association will hold its thirty-seventh annual meeting at Jackson, Tenn., May 26, 27, and 28, 1904. All ethical practitioners of the dental profession are cordially invited to attend.

R. BOYD BOGLE, *Pres.*, Nashville, Tenn.,
J. T. CREWS, *Sec'y*, Jackson, Tenn.

MASSACHUSETTS DENTAL SOCIETY.

THE fortieth annual meeting of the Massachusetts Dental Society will be held in the Massachusetts Charitable Mechanic Association Building, Huntington ave., Boston, Mass., June 1 and 2, 1904.

EDGAR O. KINSMAN, *Sec'y*,
15 Brattle Sq., Cambridge, Mass.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

THE tenth annual meeting of the Southern Wisconsin Dental Association will convene in Beloit, Wisconsin, June 8 and 9, 1904. We anticipate a pleasant as well as a profitable meeting, and a cordial invitation is extended to all.

C. W. COLVER, *Sec'y*, Clinton, Wis.

KANSAS STATE DENTAL ASSOCIATION.

THE Kansas State Dental Association will hold its thirty-third annual meeting in Topeka, Kans., on May 12, 13, and 14, 1904.

GEO. A. ESTERLY, Lawrence, Kans.

INDIANA DENTAL ASSOCIATION.

THE Indiana Dental Association will meet in Indianapolis, Ind., June 14, 15, and 16, 1904. A fine meeting is expected.

A. T. WHITE, *Sec'y*, New Castle, Ind.

MINNESOTA STATE DENTAL ASSOCIATION.

THE twenty-first annual meeting of the Minnesota State Dental Association will be held in St. Paul, June 16, 17, and 18, 1904.

GEO. S. TODD, *Sec'y*, Lake City, Minn.

NORTH CAROLINA STATE DENTAL SOCIETY.

THE thirtieth annual meeting of the North Carolina State Dental Society will be held at Morehead City, N. C., June 29 to July 2, 1904.

J. S. BETTS, *Sec'y*, Greensboro, N. C.

NORTHERN OHIO DENTAL ASSOCIATION.

THE forty-fifth annual meeting of the Northern Ohio Dental Association will be held at the Western Reserve University Dental College, Cleveland, Tuesday, Wednesday and Thursday, June 7, 8, and 9, 1904. The program is a strong one, and will be of exceptional interest to the general profession. The motto for the year is the "Annihilation of Pain in Dentistry." Essayists and clinicians have been selected with this thought ever foremost. The best authorities and the most successful men in this line of work will be at this meeting. The members of the profession are cordially invited to attend. It is expected that we will have the largest attendance of any meeting ever held in this section of the country. You cannot afford to miss it. Come!

W. G. EBERSOLE, *Cor. Sec'y*, Cleveland, O.

NEW JERSEY STATE DENTAL SOCIETY.

THE New Jersey State Dental Society will hold its annual convention in the Auditorium, at Asbury Park, N. J., July 21 to 23, 1904.

Intending exhibitors should apply direct to the chairman of the Exhibit Committee,

W. G. CHASE, Princeton, N. J.

THE GEORGIA STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting of the Georgia State Dental Society will be held in Athens, Ga., June 28, 29, and 30, 1904.

Arrangements are being made to make this the greatest convention ever held in Georgia. All ethical practitioners are cordially invited.

A. M. JACKSON, *President*,
D. H. McNEILL, *Cor. Sec'y*.

MAINE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Maine Dental Society will be held in Bangor, Me., July 19, 20, and 21, 1904.

All ethical dentists are invited to attend, and we especially extend an invitation to natives who are practicing out of the state to make this a "home week." We expect men of national reputation to give clinics and read papers.

Reduced rates will be given on transportation and at hotels.

WILL S. PAYSON, *Ch'man Ex. Com.*,
Castine, Me.

EASTERN DENTAL SOCIETY OF NEW YORK CITY.

THE twenty-sixth regular meeting of the Eastern Dental Society of the City of New York was held on Thursday, March 3, 1904, at its new quarters, Clinton Hall, with a large attendance.

Dr. Ellison Hillyer, assistant professor to the chair of oral prosthetics at the New York College of Dentistry, delivered a very instructive talk on "Some Points in Crown and Bridge Work." The speaker was accompanied by Dr. Gould, demonstrator at the same college, and both were warmly greeted by the

members of the society. After the address a free discussion followed, during which some important points were brought out. Dr. Hillyer received the hearty thanks of the society for his readiness in accepting the invitation to speak, and he in return cheerfully volunteered his services for the future. The meeting was followed by a collation in honor of the visitors.

JOSEPH SOOKNE, *Sec'y*.

THE twenty-seventh regular meeting of the Eastern Dental Society of the City of New York was held Thursday, April 7, 1904, at their quarters, Clinton Hall. The attendance was very large, owing to the fact that all of the Eastside dentists were invited to attend the meeting.

The speaker of the evening, R. Ottolengui, M.D.S., editor of *Items of Interest*, delivered a most instructive and interesting lecture on "The Comparative Merits and Demerits of Gold and Plastic Fillings," lasting for over an hour and a half. After the lecture a free discussion followed, in which many members participated. At the conclusion of the debate a hearty vote of thanks was extended to the speaker for his good will in helping the Eastern Dental Society to promote advancement in professional knowledge among its members. After the meeting Dr. Ottolengui and his two friends and colleagues, Dr. Chas. A. Meeker, Newark, N. J., and Dr. Chas. F. Ash, Brooklyn, N. Y., who accompanied him to the meeting, participated in a collation tendered in their honor in the café in the building.

The next regular meeting will be held on Thursday, May 5, 1904, at Clinton Hall, 151-153 Clinton st., New York city.

JOS. SOOKNE, *Sec'y*.

VERMONT STATE DENTAL SOCIETY.

AT the twenty-eighth annual meeting of the Vermont State Dental Society, held at Montpelier, Vt., March 16 to 18, 1904, the following officers were elected for the ensuing year: H. Burbridge, Woodstock, president; Geo. F. Barber, Brattleboro, first vice-president; Geo. O. Mitchell, St. Albans, second vice-president; Thomas Mound, Rutland, secretary; Grace L. Bosworth, Rutland, corresponding secretary;

W. H. Munsell, Wells River, treasurer; J. A. Robinson, Morrisville, state prosecutor. Executive Committee—J. Churchill Hindes, Vergennes; C. H. Kent, Barre; Harry F. Hamilton, Newport.

Drs. John F. Dowsley, Boston, Mass., and Henry McManus, Hartford, Conn., were elected honorary members of the society.

The next meeting will be held in Rutland, Vt., on the third Wednesday in March 1905.

THOMAS MOUND, *Sec'y*, Rutland, Vt.

RED RIVER VALLEY DENTAL SOCIETY.

At a meeting of the dentists of the Red River Valley, held at Crookston, Minn., March 21, 1904, the Red River Valley Dental Society was organized with a charter membership of twenty-four, and the following officers were elected: W. A. Robertson, Crookston, Minn., president; J. E. Argue, Red Lake Falls, Minn., vice-president; J. F. Boles, Crookston, secretary; S. Rowan, Hillsboro, N. D., treasurer. Board of Directors—C. F. Fiset, Grand Forks, N. D.; G. K. Hanning, Thief River Falls, Minn.; G. A. Penney, Stephen, Minn. Membership Committee—H. E. Jaehning, Fertile, Minn.; A. J. Bell, Minto, N. D.; D. L. Stanton, Cass Lake, Minn.

The next meeting will be held at Grand Forks, N. D., on the first Monday in July.

J. F. BOLES, *Sec'y*, Crookston, Minn.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE next meeting of the Arkansas State Board of Dental Examiners will be held May 10, 11, and 12, 1904, in Little Rock, Ark., for the examination of all applicants. Those having applied for examination will report to the secretary Tuesday morning, May 10, 1904, with rubber dam, gold, plastic filling material, and instruments, to demonstrate their skill in operative dentistry. Anyone who wishes may bring his patient; so far as possible patients will be furnished. The board will select the cavity to be filled. The examination will cover all branches of the dental profession. No temporary certificates are issued at any time. Examination fee, fifty dollars. For further information write the secretary.

A. T. McMILLIN, *Sec'y*, Little Rock, Ark.

NORTH CAROLINA EXAMINING BOARD.

THE Board of Dental Examiners of North Carolina will meet at Morehead City, N. C., June 27, 1904.

J. S. BETTS, *Sec'y*, Greensboro, N. C.

MASSACHUSETTS BOARD OF REGISTRATION.

THE next meeting of the Massachusetts Board of Registration in Dentistry for the examination of applicants will be held in Boston, on June 22, 23, and 24, 1904.

Application blanks and all necessary information furnished by the Secretary.

G. E. MITCHELL, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

DENTAL COMMISSIONERS OF CONNECTICUT.

THE Dental Commissioners of Connecticut hereby give notice that they will meet at Hartford, on May 14, 1904, as prescribed by law, and will adjourn to July for the summer examinations, so as to enable those students who do not finish their college or other educational course until June an opportunity to secure a license to practice without the long delay now made necessary because of being required to wait until November.

Hereafter the November examinations will be dispensed with, until further notice.

By direction of the Dental Commissioners.

J. TENNEY BARKER, *Recorder*,
Wallingford, Conn.

MARYLAND BOARD OF DENTAL EXAMINERS.

THE Maryland Board of Dental Examiners will meet for examination of candidates on May 4 and 5, 1904, at the Baltimore College of Dental Surgery, at 9 A.M. Candidates must pass a written examination in anatomy and physiology, pathology, therapeutics, and materia medica, operative and mechanical dentistry, chemistry and bacteriology, and oral surgery; must insert a gold filling in the mouth, and exhibit specimens of prosthetic work properly vouched for. Application blanks properly filled, accompanied with the fee of ten dollars, must be filed with the secretary prior to May 4th.

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

CALIFORNIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of California will hold its next examination in San Francisco, commencing on May 23, 1904, and will also hold an examination in Los Angeles, commencing on June 13, 1904.

F. G. BAIRD, *Sec'y*.

TEXAS BOARD OF DENTAL EXAMINERS.

THE Texas State Board of Dental Examiners will hold its next examination in Corsicana, Texas, beginning on May 9, 1904, at 10 A.M.

For further information address

C. C. WEAVER, *Sec'y*, Hillsboro, Texas.

OKLAHOMA BOARD OF DENTAL EXAMINERS.

THERE will be a meeting of the Oklahoma Board of Dental Examiners held at Shawnee, Oklahoma, on Monday and Tuesday, May 9 and 10, 1904, for the purpose of examining candidates for license, and such other business as may properly come before it. For particulars regarding registration apply to

A. C. HIXON, *Sec'y*, Guthrie, Oklahoma.

KANSAS BOARD OF DENTAL EXAMINERS.

THE Kansas Board of Dental Examiners will hold a meeting in Topeka, Kans., May 9th, beginning promptly at 9 A.M., for the purpose of examining candidates who desire a license to practice in the state. The examination will be practical and theoretical. Each candidate must furnish patient, instruments, and all materials necessary for the following: Gold, amalgam, and cement filling; vulcanite plate and a crown. The theoretical examination will be written, and will consist of such branches as are taught in dental colleges.

For further information address

M. I. HULTS, *Sec'y*, Hutchinson, Kans.

ALABAMA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners for the State of Alabama will meet in Anniston, Ala., on Monday before the second Tuesday in May 1904. In addition to the regular written

examination, the following requirements will be added, viz: Each applicant must fill at least two teeth, approximal cavities, one with gold, the other with alloy, work to be done under the immediate supervision of the board; the board to determine or pass on suitable selections of cavities. The board will try to furnish subjects, but failing to do so, applicants for license must find or bring their own subjects, also instruments and material. Each applicant must bring a partial upper denture—not less than eight teeth—ready for soldering, hard solder required, which work must also be done under supervision of the board.

THOS. P. WHITBY, *Sec'y*, Selma, Ala.

TENNESSEE BOARD OF DENTAL EXAMINERS.

THE Tennessee State Board of Dental Examiners will meet at Jackson, Tenn., on May 26-28, 1904, for the examination of applicants. Applicants are required to furnish their own instruments and materials for operative and mechanical work.

F. A. SHOTWELL, *Sec'y*, Rogersville, Tenn.

WEST VIRGINIA BOARD OF DENTAL EXAMINERS.

THE West Virginia State Board of Dental Examiners will hold its spring meeting for examinations June 1, 2, and 3, 1904, at Wheeling, W. Va.

For further information address

H. M. VAN VOORHIS, *Sec'y*,
312 Main st., Morgantown, W. Va.

WISCONSIN BOARD OF DENTAL EXAMINERS.

THE next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates desiring license to practice dentistry in Wisconsin will be held in Milwaukee, at Hotel Pfister, June 1, 1904.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry consecutively for four years or an apprentice to a dentist engaged in the reputable practice of dentistry for five years.

J. J. WRIGHT, *Sec'y*,
1218 Wells Bldg., Milwaukee, Wis.

OHIO BOARD OF DENTAL EXAMINERS.

THE Ohio Board of Dental Examiners will meet in Columbus, O., June 28, 29, and 30, 1904, at the Hotel Hartman, for examination of candidates for certificates of registration. Application should be filed with the secretary by June 18th.

H. C. BROWN, *Sec'y*,
185 E. State st., Columbus, O.

MINNESOTA BOARD OF DENTAL EXAMINERS.

THE Minnesota State Board of Dental Examiners will meet for the purpose of examining applicants for license on June 13, 14, and 15, 1904. No application received after 12 M. June 13th.

The meeting will be held at the dental department of the State University of Minneapolis.

C. H. ROBINSON, *Sec'y*,
Wabasha, Minn.

COLORADO BOARD OF DENTAL EXAMINERS.

THE regular semi-annual meeting of the Colorado State Board of Dental Examiners will be held in Denver, June 7, 8, and 9, 1904. The examination will be both theoretical and practical, and applicants for the examination must be prepared to do such practical work as is required. All applications must be filed before June 7th.

M. S. FRASER, *Sec'y*,
407 Mack Bldg., Denver, Colo.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburgh, June 8 to 11, 1904.

For papers and further information, applicants for examination must address

HON. C. N. SCHAEFFER, *Sec'y Dental Council*,
Harrisburg, Pa.

MONTANA BOARD OF DENTAL EXAMINERS.

THE annual meeting of the Montana Board of Dental Examiners will be held in

Helena, Mont., June 6, 7, and 8, 1904. Application blanks may be obtained from the secretary. Applicants must furnish all materials for demonstration.

D. J. WAIT, *Sec'y*, Helena, Mont.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE next annual meeting of the National Association of Dental Faculties will convene at 10 A.M., June 9, 1904, in Washington, D. C. The Executive Committee will be in session the afternoon of June 8th, to consider such matters as may be brought before it. Arrangements are being made with the railroads for one and one-third fare on the certificate plan. The hotel as headquarters, together with the railroad rates, will be announced later by circular letters to the colleges.

H. B. TILESTON, *Chairman Ex. Com.*,
S. W. FOSTER, *Sec'y*.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their annual meeting in the Coliseum building, corner Thirteenth and Olive streets, St. Louis, Mo., on the 25th, 26th, and 27th of August, beginning promptly at 10 A.M.

Telephone and telegraph offices in the building. Hotel accommodations will be secured for the members.

Special railroad rates will be secured for the members in the East desiring to attend, trains leaving New York on the morning of the 23d.

CHAS. A. MEEKER, *Sec'y and Treas.*

Special Notice.

It will be necessary for the secretaries of all those members of the National Association of Dental Examiners who desire copies of the proceedings of the meeting held in 1903 at Asheville, N. C., to send in their names and addresses to the undersigned.

The secretary does not possess occult powers and but nineteen states have responded as the result of two notices in the journals during the foregoing year.

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

THE South Dakota State Board of Dental Examiners will hold its next regular session for the examination of applicants for license at Aberdeen, S. D., June 9, 1904, beginning at 1.30 P.M. All applicants will be required to insert at least two gold fillings, and such other work as the board may require. Besides the regular operating instruments, each candidate is required to bring a bridge of not less than four teeth, including one Richmond crown, and one molar shell crown, invested ready for soldering.

Application must be made to the secretary at least one week before examination takes place.

G. W. COLLINS, *Sec'y*, Vermillion, S. D.

ILLINOIS BOARD OF DENTAL EXAMINERS.

THE next regular meeting of the Illinois State Board of Dental Examiners to examine applicants for license to practice dentistry in this state will be held in Chicago, May 6 and 7, 1904.

Under an opinion of the attorney-general the following are eligible to take the examination before the Board: "Anyone holding a medical diploma from a reputable medical college; anyone who has been a legal practitioner of dentistry for ten years prior to

moving into the state, and anyone who failed to register in this state at the time the law went into effect, which was in 1881."

Candidates must furnish their own patients, and come provided with the necessary instruments, rubber-dam, and gold to perform practical operations and such other work as is deemed advisable by the Board. Those desiring to take the examination should matriculate with the secretary at least ten days before the date of meeting. The examination fee is \$10.00. Any further information can be obtained by addressing

J. G. REID, *Sec'y*,

1204 Trude Bldg., 67 Wabash ave., Chicago.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the theoretical branches in the assembly room of the State house at Trenton, N. J., on July 5, 6, and 7, 1904, sessions beginning promptly at 9 A.M.

The practical prosthetic and practical operative work will be done in Newark. All applications must be in the hands of the secretary ten days prior to the examination.

For further information apply to

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MARCH 1904.

March 1.

No. 753,529, to FREDERICK TEAGUE. Dental bridge.

No. 753,679, to JOHN C. DAVIS. Adjustable dental impression cup.

March 15.

No. 754,841, to GEORGE C. BESSONET. Tooth-cleaning implement.

March 22.

No. 755,320, to WALTER K. SEELYE. Apparatus for heating air.

No. 755,425, to ALEXANDER W. WIMMER. Automatic dental plugger.

March 29.

No. 755,670, to CHRISTOS JOANNIDA. Dental impression tray.

No. 756,138, to ARNOLD A. PETERSEN. Tooth-brush attachment.

THE DENTAL COSMOS.

VOL. XLVI.

JUNE 1904.

No. 6.

ORIGINAL COMMUNICATIONS.

SOME VIEWS ON FRACTURES OF THE LOWER JAW.

By HENRY C. BOENNING, M.D., Philadelphia, Pa.

(Read before the New Haven Dental Association, at its annual convention, New Haven, Conn., March 15, 1904.)

FRACTURE of the jaw-bones is of much interest to the dental practitioner, because the most frequent sequel to this injury is the loss of normal occlusion, whereby the teeth are thrown partly or entirely out of commission as organs of mastication.

Fracture of the lower jaw stands fifth in the entire series of fractures of the skeleton. Fracture of the upper jaw is relatively a rare occurrence, and is always the result of violence directly applied. Fractures of the lower jaw are generally the result of violence; occasionally they are the result of muscular action. Of course, when disease invades the bones fracture occurs with greater ease. In tabulating 1338 fractures of the lower jaw collected from various hospital reports, I find that 148 occurred in women and 1190 in men; or, in a general way, fracture of the lower jaw is more than eight times as common in men as in women. This is readily understood when we consider the larger exposure of men to injury in the trades and occupations.

It is not my purpose, however, to take

up a description of fracture of the lower jaw didactically, but rather to present some views on certain practical features pertaining to this fracture not ordinarily discussed in books. Fractures of the lower jaw are clinically best considered, first, as those of the body of the mandible, and second, those of the rami and their processes. Fractures of the body of the bone are almost universally compound, due to the deep penetration of the closely set tooth-sockets and the dense adherence of the gum structures to the periosteum.

FORCES DETERMINING THE POINT OF FRACTURE.

They are also frequently bilateral, and in every case of fracture of the lower jaw that is brought to the hospital for treatment it is the rule to make a most careful examination for fracture at some other part of the bone. The rule reads, "Always look for fracture number two." This occurrence is readily understood when we consider the shape of the inferior maxillary bone. When violence is

applied directly to the point of the chin, it is common to have bilateral fracture near the mental foramina, due not to the impact of the blow alone, but also to the resistance of the condyles in the glenoid cavities and to the muscular control of the rami. When the blow is received on the chin, the powerful elevator muscles of the lower jaw instantly contract by reflex, and fix the jaw. Thus the force from in front meets the force of resistance behind, causing a recoil of vibration, and fracture at the weakest point or points of the bone results, and is often bilateral.

A very simple illustration of these forces is seen when you take a clay pipe-stem and stand it on end on a hard surface, and tap the free end with a piece of stone or other hard material. When the blow is sufficient, the pipe-stem breaks somewhere near the middle, rarely near the ends. As the vibrations are almost instantaneous in transmission, we demonstrate that the fracture of the pipe-stem is the effect of two forces—the direct and the recoil.

Where the violence is expended at the side of the body of the jaw-bone, and is of such force as to crush through the bone, its continuity is at once destroyed, and a second fracture is very rare; but if the force be less severe, a fracture may result at or near the point of violence, with another at the opposite side, at an entirely different part of the bone. Thus, in a case at the Garretson Hospital, admitted in January last, a fracture of the body on the right through the canine socket was associated with oblique fracture through the lower part of the left ramus. In the case of a professional boxer, brought to the hospital one night last fall and admitted to the ward, suffering from concussion of the brain—the result of the “punch soporific”—it was found the next day that the jaw was stiff, and violent pains, especially on the left side, followed attempts at opening the mouth. A careful examination showed a fracture through the neck of the right condyle, and on the left side a vertical fracture of the ramus. As the teeth of the left side were unimpaired,

as far as sensation was concerned, it was decided that there was no involvement of the inferior dental canal or nerve. It is not an exaggeration to say that these fractures represent the sum of the forces of direct violence and of recoil. It is a well-known clinical fact, and one admitted by every surgeon, that a blow at the side of the head is sometimes followed by fracture of the opposite side, without injury at the point of violence. It occurs quite often that a blow at one side of the head is without effect on the skull, but produces contusion and laceration of the meninges and brain substance opposite to the point where the violence impinged. Here the forces of vibration meet, and the fracture or other injury is the result.

Many years ago, when I first took up this question and expressed my belief that mandibular fracture—like the *contre-coup* fracture of the skull, where the force may be said to be applied at zenith and the fracture occur at nadir—was the result of opposing forces of vibration, I received no encouragement in taking that position; closer investigation, however, has convinced a number of those who differed with me that my views were correct. It was especially pointed out to me then that the parabolic curve of the lower jaw would disseminate the vibrations of force. Certainly it would project them into infinite space were the jaw separate from the skull, and a mere bone in the hands of the student of anatomy; but by virtue of its articulations and dental occlusions it forms with the skull an oval which serves for the transmission of force with the same effect as the cranial ellipse.

DIRECTION OF THE FRACTURE.

The direction of the line in complete fracture is interesting. Through the body it is almost uniformly oblique. The only vertical fracture of the body of the lower jaw that I ever saw was in a child six years old, in which case, as the result of a fall, there was separation of the two halves of the bone at the symphysis. In this case there was probably delayed ossific union, and it may be

likened to the transverse fractures of long bones through the epiphyseal cartilage. The line of fracture is often angulated; thus a vertical fissure through the process deflects at the body and continues at an angle obliquely through the body of the bone. The reason for this is that the fracture line is through the path of least resistance.

FRACTURE DUE TO MUSCLE FORCE.

Muscle force is seldom accredited as being an active factor in fracture of the lower jaw. A case—that of a woman of sixty-four—sent to me by a practitioner of Trenton, had bilateral fracture through the body of the mandible in the molar region. The patient slipped on the ice, fell forward on her hands, threw her head back strongly, and landed on her shoulder and side. Her face did not strike the pavement. When helped to her feet she was alarmed to find her mouth bleeding. In this case the involuntary reflex of the elevator muscles acted with great force, and bilateral fracture resulted. It is but fair to add that some of the lower molars had been removed, and this condition at her time of life facilitated the fracture. In the early part of this paper I spoke of instantaneous muscular reflex in response to a blow on the jaw. But here is muscular action the result of mind-action, involuntary as far as the individual is concerned, but nevertheless in response to the sense of preservation which is resident in every cell of the human body. Every portion of our organism is in a state of latent apprehension. A common illustration of this is the action of the eyeball in retreating deeply into the orbit at the approach of threatened injury. Here the latent apprehension of the muscles has been quickened by some mental act of which the individual is personally unconscious, and the eye has been pulled back of the protecting orbital ridges. These acts of unconscious cerebration for the preservation of the organism are probably functions of the subconscious mind, that sees and acts before the conscious mind perceives—but I must confine my paper to fractures of

the jaw, and I will not follow the temptation to discuss matters psychological, and therefore will but touch on that which concerns its association with the actions of the muscles of the jaw. Severe convulsive muscular action has often caused fracture of the bones of the skeleton, and there are a few recorded cases of fracture of the mandible.

TREATMENT OF MANDIBULAR FRACTURE.

The treatment of fractures of the lower jaw is widely discussed in the text-books, and the result of such treatment is generally said to be entirely satisfactory.

From the number of cases of malocclusion and mandibular deformity following fracture that have been brought to my notice, and from personal experience, I hold that treatment of fracture of the lower jaw is difficult, requiring much care and skill, and even then is often followed by troublesome sequelæ. Perverted alignment, ununited fracture, osteomyelitis from septic infection, deformity, caries, necrosis, disease, and loss of teeth, are oftener seen than perfect results. Nor are my deductions local or limited. From careful inquiry I find that unsatisfactory reports on the treatment of fracture of the lower jaw are abundant throughout the surgical world. Five years ago I addressed a letter to about a hundred representative surgeons in this country and abroad, asking their personal experience in the treatment of the fracture under discussion. I received a number of answers, and with one exception all stated that perfect results were difficult to obtain. At first sight this seems to be without warrant. But when we consider that fractures often occur in jaws more or less distorted or changed by the loss of teeth, it is more easily understood. Now and then we are called upon to treat a case in a subject who is edentulous.

The means used in treatment are various. Splints are used both within the mouth and applied externally. Operations for wiring, fixation of fragments by metal screws or by a pin of some animal material properly asepticized, are

growing in favor. The mouth-splints in use, such as the Hammond, vulcanite interdental prop, the Angle apparatus, and others, are familiar and useful appliances in many cases, but not infrequently fail to keep the fragments in position. Of the splints named, I prefer the Hammond wire splint carefully adjusted. The danger in all splints attached to the teeth, or exerting pressure thereon, is that they bring about a certain amount of leverage by approximating the alveolar end of the fracture and thus separating or displacing the line of fracture through the body of the bone. This permits the intrusion of shreds and other soft tissue, and non-union is often the consequence. Another objection to splints within the mouth is that they interfere somewhat with mouth sanitation.

SURGICAL TREATMENT OF MANDIBULAR FRACTURE.

In fractures of the body of the mandible it has been my aim and practice to discard all splints. I cut down upon the fracture, remove the shreds of tissue and clot, if any, and drill through each fragment; then silver wire of No. 18 or 20 gage is threaded through the drill-holes. The fragments are then accurately approximated, the wire twisted together tightly, and the resulting wire knot is bedded firmly against the bone. The wound is then closed, strict antisepsis being carried out. The advantages of this line of treatment are obvious. Mouth sanitation can be enforced; there is perfect apposition of the ends of the fragments, and hence much lessened tendency to complications and subsequent deformities. Where the fracture is comminuted, small loose fragments had better be removed, but larger fragments, although loose, should be left *in situ* and wired. The osteogenetic function of the periosteum provides, as a rule, ossific deposits sufficient in such cases to bring about a good result, and where the wiring has been accurately done, and the fragments are immobile, a good result should follow.

CARE IN POST-OPERATIVE BUCCAL ANTISEPSIS.

Of equal importance with accurate coaptation of the fragments and immobility is mouth sanitation. No matter how perfectly the bone has been set, should infection occur serious results will follow, for infection is the foe of good union. The most painstaking care should be exercised in keeping the buccal cavity surgically clean. The dental practitioner by means of rubber dam isolates teeth requiring his services, and can thus asepticize his field of operation. The oral surgeon cannot secure asepsis of the mouth. Though he may filter the air entering the air-passages, he cannot close the buccal cavity behind; hence the mouth is constantly contaminated from pharyngeal, alimentary, and nasal communications. But he may wonderfully improve the degree of buccal cleanliness, by correcting stomach irregularities by means of laxatives and proper feeding; also by flushing the nose with saline and mildly antiseptic solutions. The nasal meatuses are a veritable hotbed of germ life, and it is imperative that they should be kept clean. The use of antiseptic gargles and mouth-washes will be of great service. Brushing the teeth when fracture of the jaw exists had better be omitted. The nurse may substitute interdental injections of hydrogen dioxide, followed by stronger antiseptics. The wound communicating with the fracture should be thoroughly cleansed as often as necessary, and if possible dressed with sterile borated gauze.

I have often tried to seal up the buccal wounds in fracture with iodoform-collodion, but frankly confess that I was unsuccessful. One of my assistants devised a wire shield that could be bent down upon the dressings, and kept in position by ligating to the adjoining teeth. This cap was quite efficient in keeping the dressing in place, but it became speedily offensive and caused so much annoyance to the patient that it was removed, to prevent the tongue from pushing it out of place, with the possible danger of disturbing the fragments.

THE TECHNIQUE OF CAVITY PREPARATION FOR PORCELAIN INLAYS IN THE SIX ANTERIOR TEETH.

By ERNST J. EISEN, D.D.S., and Dr. WM. H. CUDWORTH, Milwaukee, Wis.

IN the February issue of the DENTAL Cosmos we presented a paper upon "A Method of Cavity Preparation for Porcelain Inlays in the Six Anterior Teeth," as to which we feel that its empirical nature left many things unexplained, many points of detail having to be omitted. A minute study of the subject and its presentation in a more exhaustive form will facilitate a closer observance of the characteristics of cavity formation of that description and the principles governing its construction.

The hope of seeing porcelain assume the position of the material *par excellence* for fillings in the anterior teeth should lead us to consider each step whereby we can bring it nearer a realization of our ideal. For a proper understanding of the subject it is necessary that certain laws and theories be studied in regard to their application to this work.

The feature which has most retarded the advance of porcelain to its rightful position as a filling material has been the employment of zinc oxyphosphate as the agent for retention. Recognizing this fact, we must consider ways whereby we may overcome the weak qualities of cement, and, this being found impossible, endeavor to control them. Cement, in fact, besides its inability to meet expectations entirely as the agent for retention, yields to some action which makes permanent sealing of all margins impossible.

Whether the dissolution of cement around the margins of porcelain inlays be due to mechanical or chemical action we are not ready to say with any degree of certainty. Many share the belief that the chief cause of dissolution is to be

found in mechanical action. The apparent check to its progressive dissolution, if caused by chemical means, may be accounted for through capillary action. We may conclude, then, that dissolution is accomplished by chemical and mechanical means until capillary action forbids entrance of the fluids of the mouth in the space between inlay and margins. Inlays not including the incisal angle may be considered immune from any action other than a chemical one.

Our attention has often been called to a dissolution, or disintegration, of the cement at the incisal margin. It probably in no way impairs the efficacy of the filling, but the presence of an unfilled space is likely to cause some uneasiness to both operator and patient. This space, and any ineffectual sealing of a cavity, must receive attention, and the restoration of the incisal angle calls for study as to how best to overcome this distressing feature. The question here arises where to check dissolution, for we should not allow the marginal space to become involved to some indefinite point where disintegration ceases.

Adaptation of the walls of the inlay to the margins of the cavity is a feature in which we strive to attain the acme of artistic results. Men who recommend spherical cavities claim that adaptation of an inlay to be one of their great advantages; but for those not deluded by false ideas and unsound theories, this is not the only thing to be accomplished. With angular cavities we are not depending upon a theory such as "crystallization under pressure," but we come in contact with laws, and upon these base our cavity construction; and when we consider the

question of inlays from this view we are nearer a solution of the problem. The law in regard to adaptation is that of the inclined plane.

"An inclined plane is a surface inclined so as to make an oblique angle with the horizon. When a body is placed on an inclined plane, the gravity pull is resolved into two component forces. One of these acts perpendicularly to the plane, producing pressure upon it, the other component tending to produce motion down the plane. To resist this mentioned tendency, and to hold the body in its position, a force may be applied in three ways: (1) In a direction parallel to the length of the plane. (2) In a direction parallel to the base of the plane, *i.e.* horizontal. (3) In a direction parallel to neither the length nor the base. The mechanical advantage to be derived from the use of the inclined plane varies with the three conditions above given."

This law finds its first application in the construction of a labial cavity. Except where such a cavity extends to some degree below the gingival margin its preparation is simple, and in most cases may be quickly accomplished. A cone bur of proper diameter will give us a result for retention far superior to that which can be obtained by the use of a rose or other round-surfaced bur. A cavity of this nature may be made slightly larger at the orifice than at the base without impairing the adaptation of

FIG. 1.



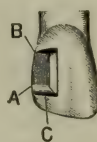
the inlay. The flaring of the walls must be gradual from the base, with but the smallest possible degree of difference in the diameter of the base and orifice. (Fig. 1.)

It becomes apparent that the more firmly the inlay is driven into place the closer does it apply itself to the lateral walls.

SIMPLE APPROXIMAL CAVITY — LABIAL ASPECT.

The preparation of a simple approximal cavity, labial aspect, is governed by very simple rules. The gingival wall should first be formed at right angles to the long axis of the tooth. The pulpal wall should be cut parallel to the long axis, and slightly obtuse to the lingual wall; the lingual wall is to be flat, and the incisal wall obtuse to the lingual. The inlay when adapted to this cavity will go to place in the direction of line A, Fig. 2. The space originally occu-

FIG. 2.



plied by the matrix at B will be taken up, and that occupied at C will be obliterated by the inlay's course down the inclined plane. The inlay accommodates itself to all surfaces of the cavity, and no line of demarkation is perceptible.

SIMPLE APPROXIMAL CAVITY—LINGUAL ASPECT.

A simple approximal cavity with lingual aspect is shaped upon similar lines. The pulpal wall should be cut at right angles to the gingival and incisal walls, the incisal wall at an obtuse angle to the labial. The only difference in a cavity from the lingual aspect is the cutting away of more or less of the thin edge of the labial plate. This is done to prevent the formation of a thin line of enamel, resulting from the oval surface of the labial portion of the tooth. (Fig. 3.)

In taking up the technique of cavity preparation for cases including the incisal angle, the determining feature in all cases should be a study of the occlusion. No definite lines for any incisal cavity should be decided upon until this has been accurately determined, and the direction noted in which force is applied through mastication. Our efforts in ref-

erence to this should include the study of the jaws in repose, in positive occlusion, and in false occlusion by having the incisors brought together at their edges.

FIG. 3.



It is also very important to determine whether the normal occlusion is high or low on the lingual plate of the upper incisors.

APPROXIMO-INCISAL CAVITIES.

When confronted with a cavity of this class several features are to be taken into account in order that an inlay may be satisfactory regarding its adaptability to all walls, and to nicely counteract the force which it must withstand. The difficulty of overcoming the space between inlay and margin at the incisal edge is here met. Adaptation may be made so accurate as to leave no perceptible line at the incisal angle of cavities planned as in Figs. 4 and 5.

FIG. 4.



FIG. 5.



Front. Side.

In our estimation there is little choice, as far as the advantages of construction go, between the cavity as shown in Figs. 4 and 5. In some cases, where extensive separation is impossible and where the forces of mastication are in the direction of the long axis of the tooth, the cavity as shown in Fig. 5 is preferable. For this cavity the labial wall is to receive treatment in the same manner as other approximo-incisal cavities, which is shown later. The pulpal wall should be parallel to the long axis of the tooth, the gingival wall at right angles to the

pulpal wall, and the lingual parallel to the inner surface of the labial plate.

For a cavity as shown in Fig. 4 the gingival wall is to be flat and at right angles to the long axis of the tooth. This may be formed with a right-angle fissure bur. The pulpal wall is formed by drawing the bur from the gingival margin incisally to within a sixteenth of an inch, or to such a degree as is warranted, of the incisal ridge. The incisal wall is to be cut at an obtuse angle, incisally, to the inner surface of the labial plate. The inner surface of the labial wall of enamel is cut at a right angle to the pulpal wall, through the action of the bur in its downward course toward the incisal ridge.

Where occlusion is favorable, and the incisal edge permits of such treatment, a step may be cut for the express purpose of counteracting mechanical dissolution.

FIG. 6.



The step is confined entirely to the lingual wall, not being perceptible on the labial plate, and is intended to overcome that dissolution at the incisal edge which might otherwise mar the perfectness of an approximo-incisal restoration.

The preparation of the labial wall is identical in all cases where the incisal angle is involved, and the adaptation of the inlay to the cavity is directly dependent upon the care with which this wall is designed.

In order that there may be perfect adaptation in all parts of the cavity the labial wall must be devoid of any bevel and be parallel with the long axis of the tooth. With a chisel the gingival two-thirds should then be beveled gingivally and inwardly, and form an angle at the gingival margin. This accomplished, we have a cavity to which an inlay will adapt itself perfectly and overcome at all parts the space occupied by the matrix. Constructed in this way we accommodate

the inlay to those principles of the inclined plane which make it perfect from a mechanical standpoint.

COMPOUND APPROXIMO-INCISAL CAVITY.

When we come to consider the preparation of a compound approximo-incisal cavity, the one difficulty encountered is how to overcome the shrinkage of the porcelain, and also the adjustment of the walls of the inlay to the surfaces of the cavity when the matrix is removed.

In a large compound filling the shrinkage in the porcelain is unequal gingivoincisorally and mesio-distally. As to how this shrinkage may be entirely done away with we do not venture a suggestion, but we may so construct the cavity as to cause the shrinkage to assert itself entirely at the gingival margin, and allow the non-compensation of matrix to show at this place.

In a compound-approximal cavity, where three distinct margins are visible upon the labial wall, it is most important that the space caused by shrinkage and non-compensation when the matrix is removed should be regulated so as to be placed at the least vulnerable point, which, for a porcelain inlay, is the gingival margin. We therefore construct the cavity so as to have the inlay go into position with an axial lateral incline. (Fig. 7.) The labial wall is pre-

FIG. 7.



pared similarly to that of the approximo-incisal cavity, *i.e.* the gingival two-thirds should be beveled inwardly. The pulpal wall is to be parallel to the long axis of the tooth, the step a right angle to the pulpal wall, and the labial parallel to the pulpal wall.

The inner surface of the two labial plates should be at right angles with their antagonistic surfaces. The lingual wall is cut away except at the linguo-

gingival angle, its inner surface parallel with the inner surface of the labial plate.

APPROXIMAL CAVITIES IN CANINES.

Approximal cavities in canines require that the lingual, pulpal, and gingival walls be at right angles to each other, but that the labial wall have a bevel from

FIG. 8.



within outward of at least 5° , so that when the inlay is inserted it slides down the inclined plane which this wall forms, and is forced firmly into the linguo-gingival angle.

TREATMENT OF CAVITIES IN THE LOWER TEETH.

The treatment of cavities in the lower teeth presents some difficulties. In a measure the construction of these cavities calls for the consideration of the forces of mastication, which are directly opposite to those encountered in the upper teeth.

The construction of cavities not including the incisal angle may be identical, relatively, with those in the upper teeth. Where the incisal angles of lower teeth are involved our treatment, however, should be reversed, so as to make the lingual wall the recipient of the force applied labially.

It will be seen that by the construction of such cavities the dissolution of cement is controlled in a great degree, in that it divides the space where this occurs, obviating a direct line at the incisal edge, and so impeding dissolution as to make it of comparatively little importance.

THE SIMPLE PRINCIPLE INVOLVED.

If the above description of the preparation of the various cavities has been carefully followed it will be seen that

the prime factors in causing the inlay to adapt itself firmly and closely to all the walls depend entirely on the beveling of certain surfaces in a definite manner. The action of this bevel is that of an inclined plane forcing the inlay to travel in a definite direction, *i.e.* that direction which would approximate the walls of the inlay to the walls of the cavity.

When it is once understood that the cavity walls are constructed on definite mechanical lines, and that the force which causes the inlay to adjust itself to the cavity, and to be held there, is governed by the simple laws of the inclined plane, no great difficulty will be met with in adapting porcelain inlays to any cavity in the six anterior teeth.

SURGERY OF THE MOUTH.

By G. LENOX CURTIS, M.D., New York City.

(Read before the New Haven Dental Association, at its annual convention, New Haven, Conn., March 15, 1904.)

I FIND it no easy matter to select a subject which will interest everybody, or one that may please the majority of the members of a society. My first impulse when asked to read a paper before this society was to say something about that much-discussed and generally abhorred disease—pyorrhea alveolaris—which is ignored by many, studied by few, and successfully treated by a less number, even of those who claim to be proficient. My second impulse was to cite how the health of patients was often jeopardized by failure on the part of dentists to diagnose abscessed teeth, and who therefore erred in the treatment. Finally I thought, If I present a personal experience on surgery of the mouth, I might do more good and perhaps interest all, and also stimulate a few to move out of the beaten rut of everyday habits. I will make a few remarks about pyorrhea alveolaris in another part of this paper.

As an old lady once remarked, "Change of life is the spice of life." Change of work is not only restful, but instructive, progressive, and broadening. How many are there, among those present, who have deviated from the teachings of their preceptors, and who have worked out for themselves a new and better method of filling cavities in teeth? How many

study and diagnose obscure diseases of the mouth and adjacent parts? The opportunity is yours, and it is superior to the opportunities of the average general surgeon. Therefore I say, Look for the unseen evil.

AN ILLUSTRATIVE CASE.

I will cite a case in which the dentists in charge were so intent upon their particular method of treatment—one which I believe should be abandoned—that they lost sight of primary contributing causes of the disease. Briefly, the history of the case is this: Miss —, aged thirty-three years, was brought to me by her nasal specialist for an opinion. His question was whether the disease in the jaw was responsible for the persistent inflammation of the right naris, and to what extent the antrum was involved.

The patient gave the following history: As a child she was sickly. At the age of fourteen she had her upper front teeth, which were badly decayed, filled with gold. Her health did not improve to any great degree until after sixteen years of age. Twelve years ago she received a blow under the right eye by a frozen snowball, which left the cheekbone and eye sore for some time. Several years later she noticed that the

upper right central incisor was sensitive to pressure, and later on, a swelling appeared on the right side of the roof of the mouth. Little attention was given to this until a gumboil appeared under the lip. Six years ago she consulted a dentist, who diagnosed the trouble to be an alveolar abscess of the upper right central incisor. The abscess was treated through the pulp-canal, and was thought to be healed.

Two years later the trouble recurred, and she consulted another dentist, who followed in the lines of his predecessor. A fistulous opening in the gum over this tooth was present at this time, and the swelling in the roof of the mouth had recurred. After about six months of treatment, both swelling and fistula disappeared, and for six months the patient again thought herself cured, although there still remained an uneasy feeling and a tenderness in the affected jaw. To her amazement a swelling appeared on the buccal surface of the jaw, immediately posterior to the second bicuspid. She returned to her dentist, who apparently lost sight of the original seat of the trouble, and thought there must be an antral disease to contend with.

In consultation with another dentist it was then decided to treat the case by syringing through the fistula. Because of a tendency on the part of the fistula to close before the dentist was satisfied that the disease in the antrum had disappeared, a small rubber tube about half an inch in length was inserted into the fistula. When she returned, however, two days later, the rubber tube was missing. As the patient had no knowledge of its loss, it was concluded she had swallowed it. A vulcanite tube with a flange made after the Farrar plan was then inserted, through which the wound was syringed, and the cavity drained. Several times during the last four years of treatment the wound healed and the patient was dismissed. The fistula reappeared, and then she consulted another dentist, who referred her to a nasal specialist, who in turn consulted me. During all these years of

treatment the patient's health was poor, and she was almost constantly under the care of her family physician.

No history could be elicited of solutions passing into the nares during the treatment of the antrum.

Examination. The first glance into the mouth revealed to me the unmistakable signs of an alveolar abscess over the devitalized right central and lateral incisors. On percussion these teeth gave a leaden sound such as is always noticed in diseased conditions of the bone. The gum over these roots had a purplish hue, while over the other teeth on this side the condition appeared normal, except the part immediately surrounding the fistulous opening—which was situated between the anterior buccal root of the molar and the root of the second bicuspid, both of which were alive. There was a slight swelling in the roof of the right side of the mouth, extending from the molar forward to the incisors. Both these teeth contained large approximal gold fillings, and a temporary filling in the palatal surface of the central incisor. A probe passed through the fistulous opening, and directed forward, met with no resistance until it came in contact with the roots of the incisors, but when directed toward the antrum, a solid wall of bone could be felt. This when percussed showed unmistakable evidence of an osteoma of considerable size. Transillumination decided the question as to the necrotic conditions; the light could be dimly seen over the antrum, but the portion of the jaw anterior to it was opaque. An operation was decided upon. The patient was referred back to the dentist who treated the case, with instructions to open both the dead incisors, to sterilize and fill the canals with zinc oxychlorid, forcing it beyond the ends of the roots.

A few days later, in the presence of her family physician and nasal specialist, I operated, opening through the gum and periosteum, over the apex of these roots, which were found to be soft. Immediately back of these roots, my bur came in contact with something soft and flexible, and with a tenaculum

I hooked out the long-lost rubber tubing. With a strong bur I removed the diseased portion of these roots, and ground and curetted away all the necrosed bone and granulating tissue and débris extending from the roots of the incisors to the palatal root of the first molar, leaving bare the palatal surface of the roots of the canine and bicusps. The fistulous opening was enlarged. With heavy drills the mass of bone which was vital, and which entirely filled the antrum, except the upper and posterior portion—which was filled with fatty tissue—was ground away until the antrum was about its normal size. Communication with the nares was then re-established. The wounds were packed with gauze. This treatment was continued until the antrum was again covered with membrane and the bone tissue in the roof of the mouth reproduced. No untoward symptoms presented during the course of the treatment.

The operation was performed entirely within the mouth, and through the two openings referred to; it was accomplished without wounding or disfiguring the face, which is so often done in operations upon the jaws. The health of the patient rapidly and steadily improved, and is apparently normal.

PYORRHEA ALVEOLARIS.

I am often asked, "What is the reason that so few dentists are successful in treating pyorrhea alveolaris—a disease which belongs as much to their specialty as does alveolar abscess? Do they lack college education in this particular branch, as well as in the surgical treatment of the soft tissue, or is it due to their individual make-up?" My answer is that few men have the manipulative ability to apply that exactness of detail which is absolutely necessary to eradicate pyorrhea alveolaris.

I will now enumerate the details of the treatment necessary to success in the eradication of pyorrhea alveolaris: First, thorough removal of all pathological conditions, both from without and within the tooth. Second, the correction of

malocclusion. Third, the supporting of loose teeth with splints, and the proper dressing of the soft parts around the teeth. If these operations are all thoroughly performed, success in removing the disease ought to be the result. Of course the alveolar process is seldom, if ever, reproduced, and the position of the tooth is maintained by the cicatrix formed in the healing of the soft tissue about it, and the re-attachment of the periosteum to the tooth, which, though imperfect, occasionally occurs.

These teeth may never become as firm as they were originally, but they will become sufficiently firm for most practical purposes. This is as far as any dentist can go. Those who have not the proper knowledge of the etiology of the suppurative variety of this disease can do no more. The suppurative variety is generally caused by syphilis, which disease causes degeneracy of the alveolar process and periodental membrane, and is often mistaken for gingivitis, which is due to septic pulp-canals, and to the irritations caused by rough fillings, gold bands, the direct application of arsenic to the pulp, salivary calculus, pytalism, and secondary osseous deposits within the tooth. When a differential diagnosis has been made, and these local causes have been excluded, we may conclude that the trouble is systemic, and it should be treated as such. There is little or no advantage in asking patients if they have been treated for syphilis, for few will admit it; besides this, a large percentage of them do not know that they have a taint of that disease, as it may be inherited.

This subject in all its details I have published in a paper entitled "Syphilitic Loculosis Alveolaris," and read before the American Medical Association in June 1900. At that time I called attention also to a sign in the mouth by which the presence of syphilitic conditions can be determined, and which I designated as the "egg-skin scar," because of its resemblance to that membrane. This scar is commonly found in the mucous membrane of the mouth, usually along the ramus, alveolar ridge,

or the cheek. A more positive test, however, is found in the examination of freshly drawn blood. This is particularly valuable to determine whether there has been sufficient treatment to kill all the spores of syphilis, as the scar is permanent.

My differential diagnosis between suppurative gingivitis and pyorrhea alveolaris, briefly stated, is that in this stage of gingivitis there is an inflammation of

the soft tissues alone, which has resulted in the peridental membrane being involved, to the extent of pus formation, which pus forms pockets between the peridental membrane and the tooth. The pus generally works its way in the direction of the alveolus, which it eventually reaches. When the pus has reached and established a destructive ulceration in the alveolar process, then the disease has become pyorrhea alveolaris.

THE STATUS OF OUR PROFESSION.

By Mr. H. J. MORRIS, L.D.S.Eng., Sheffield, England.

BEFORE considering what the status of dentistry is, it would be advisable to look at the matter in a general way, and decide first of all what we mean by the term "status." Of course we all know what it means, though that does not render it less difficult to actually define.

It will, however, be satisfactorily described as the degree of esteem in which a profession is held by the laity.

A professional man, then, has a three-fold status: First, as a practitioner; second, as a member of a profession; third, as a citizen. If he lived in a suburb where no one knew what profession he belonged to, it would obviously be no help to the esteem of his neighbors even if he were a leader at the bar. His status there would depend upon other things.

Mystery-making is out of date, and the professions no longer have need of it; because the advances of science and the gradual disappearance of empiricism in trades and professions alike are a natural protection to the practitioners of many kinds of scientific work. In olden times, when there were no such medical schools as there are now, doctors maintained themselves in the good esteem of their patients and protected themselves from competition by making

much mystery about their cures. To-day that is not necessary.

A man's status as an individual practitioner is that degree of esteem in which he is held by his fellow citizens on comparing him with his professional brethren. But schools have so leveled professional ability as a whole, that professions as a whole have acquired a status in public opinion. How is this public good opinion or status arrived at, and how may it be improved?

Outside a man's place of business the public has no interest in his business. A little reflection will soon show that it is the general education of a profession which fixes its status in the public mind.

The matriculation standards are similar for ours and for the medical profession, yet the longer time spent by the latter at hospitals and text-books increases their general education *pari passu* with their special training, and hence dentistry lags behind somewhat in the public esteem. Longer brain exercises naturally produce better brains.

THE PROFESSIONAL MAN VS. THE CRAFTSMAN.

It probably takes longer to learn to forge scissor-blades than it does to get a B.A. degree, and every man will admit

that the scissor-forger is useful, and that it is good to have some of him. As for the B.A. pass-man, he is neither "fish, flesh, fowl, nor good red herring." He cannot navigate a ship, or write shorthand, or speak Dutch, or forge scissors. In fact, he is nothing in particular. But put the two men down anywhere you like on neutral ground, say in a drawing-room, or a political meeting, or a desert island, and see what will happen. The B.A. will probably play a better part in any of these situations because of his wider general education. In the drawing-room in particular will he shine, because his wider acquaintance with literature and history will give him a better command of his mother tongue and a firmer grasp of current affairs.

It has been found inconvenient for men to discuss their own business in public; if all did so the effect would be tiresome. So none do it, and as a consequence the man with the best knowledge of other topics—the man with the best general education—is most highly thought of. When, therefore, the public find out that the men in any particular walk of life have this ability in a marked degree, they connect the two, and esteem the men of that profession accordingly.

Why should a man of good education be better esteemed—as he everywhere is—than a skilled craftsman, who may perhaps be of more real use to the community?

The ultimate reason is to be found in the fact that the better a man's education the greater is his knowledge of principles and of the ultimate effects of his actions. This is the result of his wider outlook on life, which gives more power to reason out and forecast the future. Hence there is a general tendency to uniformity of conduct among educated people. We know them all to a certain extent, even before meeting them, and therefore we feel safer from knocks and jars among them. But what the ignorant man or the untutored savage will do, and what his next wild whim will be, heaven alone knows. Indeed, being a creature of impulse rather than reason, he does not always know himself.

The very essence of a skilled handicraft is repetition. It is acquired by repetition, and its use is for repetition. An impulse track is made in a mechanic's brain along which the impulses go with less and less resistance as he becomes more and more mechanical in his actions. The majority of mechanics have no use for originality of thought, because their working thoughts go best for them in a groove. Repetition is obviously easier than originality, and hence in the mechanical trades education is as a rule less than in the thinking trades, and the former employ more people. Any kind of originality necessitates previous experiences, and this for psychological reasons which cannot here be gone into.

EMOLUMENT.

It is therefore these thinking trades which can command the highest emoluments the world over, and in proportion as any trade demands a partial originality of thought, so is it as a rule better paid and more highly thought of.

Our friend the scissor-forger earns a regular weekly wage and his skill is wholly mechanical. Even the clerk, in a land where all can read and write, becomes an unskilled laborer. The abdominal surgeon's skill is also mechanical, but in addition to that he has to weigh in his mind the pros and cons of what he is going to do and balance the probabilities—always a very difficult thing—of his finding this or that condition when his work is begun. So he belongs partly to the thinking trades, etc., better paid than the scissor-forger.

Lastly come the purely intellectual and administrative occupations, such as an advocate's, a general's, a diplomat's, or that of manager of a great business. It is true that some of these are not rewarded so much in coin as in public esteem, yet as a constant attempt is noticeable among trade millionaires to convert coin into public esteem, the argument still holds.

Five thousand pounds a year does not represent the value of the premier's ser-

vices as chief thinker for England. It is merely an honorarium. His services are priceless. Men in such positions could if they would make millions by red herrings and wild-cats and other stock exchange devices.

But, after all, the question arises, "Where do we come in?" Our work is at present more stereotyped than the physician's or surgeon's. Therefore our legitimate place in the pay scale is not so high as theirs. At present we do not quite occupy our legitimate place, and

we contrive to be better paid in proportion than they; but that will not always be so unless dentistry begins to make greater demands on our thinking powers than it promises to do.

It behooves us, therefore, if we want to raise ourselves and our professional status in the public esteem, to fight against that tendency of our work to make our minds groovy, and to familiarize ourselves with the greater thoughts of men who have influenced and do influence today the wide world itself.

A NEW TREATMENT OF DENTAL FISTULÆ.

By Dr. OVIZE, St. Quentin, France.

(Read before the Section on Stomatology and Odontology, Fourteenth International Congress of Medicine, Madrid, April 1903.)

WHILE the treatment of dental fistulæ by forcing caustic or irritating agents through the root-canal gives satisfactory results in a large majority of cases, it is a plan which at times becomes difficult to carry out, either on account of the extreme narrowness of the root-canal through which the medicament has to be forced, or else because of its inaccessibility. In cases where for the reasons just stated the needle of a syringe (Pravaz) cannot be made to enter the canal, antiseptic fluids can be made to reach and go through the fistula by saturating a pellet of cotton with the desired agent, applying it at the entrance of the canal, filling up the cavity with unvulcanized rubber, and exercising upon this mass a degree of pressure slow but continuous in character. This suggestion is feasible when the canal is reasonably large, but when the diameter is even smaller than that of an ordinary sized broach this plan becomes impracticable, as the fluid would ooze out between the filling and the cavity walls.

The action of caustic or irritating agents (creasote, carbolic acid) is two-

fold, namely, antiseptic and sclerogenic. The antiseptic action exercises its desirable properties upon the hard tissues (dentin) by destroying the micro-organic cause of the infection and the products resulting therefrom. The sclerogenic action takes effect in the soft tissues. The medicament brings about a fibrinous exudate which soon becomes filled up with embryonal cells, eventually metamorphosing into normal tissue.

ANTISEPTIC VAPORS.

When, for the reasons above given, it becomes impossible to force antiseptic agents through the root-canal, I avail myself of the properties of antiseptic vapors. The method which will be described is based on the property which gases possess of expanding under the influence of heat, and has given, thus far, most satisfactory results in a number of cases of gingival fistulæ.

After isolating the tooth with the rubber dam, cleaning and disinfecting the carious cavity, the pulp-chamber, and the accessible portion of the canal, we fill the pulp-chamber with zinc oxid 95

parts, trioxymethylene 2 to 3 per cent., made into a paste of medium consistence with equal parts of creasote and formol-geranium. This paste is covered up with a thin layer of oxyphosphate cement, upon which a current of hot air is then directed and kept up for some time. Under the action of the heat thus applied, trioxymethylene gives off formaldehyd gas, and both the formol-geranium and creasote volatilize. Being under

pressure and expanding through the action of the heat, the vapors soon enter the fistula, exercising their action throughout their course. The filling of the tooth is then completed with any desirable material.

This method of treating dental fistulæ is absolutely painless, and I employ it in preference to the usual plan of forcing the antiseptic in the liquid form through the root-canal.

THE FUNDAMENTAL PRINCIPLES OF EXTENSION IN APPROXIMAL CAVITIES IN BICUSPIDS AND MOLARS.

By C. E. SLAGLE, D.D.S., Abingdon, Ill.

ANY reference to the subject of cavity extension may sound to some like "a voice from the grave," and yet to others it may be intensely interesting, because it comes very close to the principles by which the average practitioner—in his everyday drudgery over dilapidated molars—is endeavoring to work out his own existence. He finds the subject discussed and written upon in every journal perhaps as much, or more, than any other subject, and after all is said and done we may safely say that there is no principle in operative dentistry that is as universally misunderstood or the victim of as much misconception as is the original and decidedly practical idea of "extension" in cavity preparations.

We may consider approximal cavities as being extended for three purposes: First, for *prevention*; second, for *access*; and third, for *retention*.

EXTENSION FOR PREVENTION.

It is highly essential, with reference to success, that the operator, whether he be surgeon or dentist, should understand the nature of the condition he is treating. He should know "why" it originates, "how" it extends, and "what"

measures are necessary to prevent it; and with these thoughts in mind, we as dentists find ourselves in the midst of the ever interesting subject of "dental caries"—why it begins, how it extends, and what measures are necessary to prevent it.

We may say of dental caries that it is of specific origin, but is influenced to a marked extent by predisposing and surrounding conditions.

From the standpoint of the exciting cause, three things are necessary. There must be a specific infection; it must have a suitable habitat, and it must be allowed to remain in its own quietism for a definite length of time.

It must be an acid-producing organism. It must be able to cover itself over with a gelatinous material in order that it may remain *in situ* sufficiently long to produce the acid, and having done this the gelatinous covering must be of sufficient consistence to prevent the dissipation of the acid into the fluids of the mouth, but must hold it in concentrated form against the tooth for a definite length of time, so that it may dissolve the calcium salts of the enamel.

These facts necessarily suggest the idea that the portions of the teeth that would be protected from the ordinary

wear and tear to which they are subjected would be especially inviting to bacteria as a place in which to establish themselves and begin their work of destruction. These places have been called "areas of liability," and for the convenience of study have been divided into several divisions, one division including the approximal areas of all the teeth, which is the one that concerns us at the present time.

What now is the extent of this area? Dr. Black refers us to the fact that "dental caries never begins under perfectly normal gum tissue," so we may take for the gingival boundary line of this area, the gum line or interproximal tissue; for the occlusal boundary, a line just including the contact point; while the lateral boundaries would pass into the opening of the embrasures to a position in which any accumulation on the surface would be swept away during the process of mastication, brushing, or any other method of cleansing the teeth.

What, then, is meant by "extension" so far as prevention is concerned? Simply the removal of this area of liability; and when this is done, Dr. Black tells us that extension for prevention is fully satisfied.

It may readily be seen that the size of these areas is regulated to a large extent by outside influences; that the boundary lines are by no means the same in all cases and under all conditions. The teeth may be round in form, in which case the embrasures open up abruptly, necessarily making the area of liability small, while in other cases the teeth may be broad and flat on their approximal surfaces, making an extensive contact point, in which case the area of liability would be much greater.

Again, the size of these areas may be influenced by the "immunity" or "susceptibility" of the patient to dental caries. Also by the exercise of prophylactic measures—meaning by this, intelligent care in brushing and cleansing the teeth in general.

So we may see at once that there can be no hard-and-fast rule as to how much of the approximal surface of a tooth

shall be removed. What would be sufficient extension in one case would be of no benefit in another, while in some cases very little extension is necessary. The case of every patient is a study in itself. We must study the conditions which exist in each individual presenting and upon the knowledge thus gained decide just what extension is indicated; for we have no more right to unnecessarily sacrifice sound tooth-structure than the surgeon has to amputate more of one's limb than is necessary.

EXTENSION FOR ACCESS.

Having extended the cavity so far as preventive measures indicate, we next come to the matter of extension for gaining "access." Here, again, the conditions may be modified. The operator is the best judge of his own ability; some men can manipulate filling materials and adjust them to perfect adaptation where others could not.

As a general rule, however, we may say that all approximal cavities in molars and bicuspid should be made to include the occlusal surface to such an extent that the cavity will be the same size all the way to the gingiva, because the cavity must be filled from the occlusal surface; but in incisors and canines the operator is largely left to exercise his own individual skill in manipulation. The areas of liability in these teeth are so small and influenced to such a marked degree by surrounding conditions that unless the tooth-structure has already disintegrated, the matter of extension becomes one of gaining access rather than of prevention.

EXTENSION FOR RETENTION.

Lastly, but by no means the least, comes the matter of extension for "retention." The first essential point here is for us to study the occlusion and determine just how much stress that particular filling will have to stand.

We must bear in mind, however, especially with reference to approximal cavities in bicuspid and molars, that the

base must be made to support practically the entire weight put upon the filling during mastication, thus preventing any lateral pressure, which would tend to fracture. This would mean that the base of the cavity is to be made to represent a horizontal plane surface, extending from the buccal to the lingual side of the cavity. It should be a little lower where it joins the axial wall, but it must be a gradual incline and never grooved.

The buccal and lingual walls should be at right angles to the *base*, and as they pass toward the axial wall should converge to such an extent as to keep in line with the enamel cleavage.

The axial wall should be flat and meet all the other walls at a definite angle.

The real anchorage seat of these cavities should be the occlusal step cut at right angles to the approximal part of the cavity, which fortunately does not very often call for the sacrifice of any considerable amount of tooth-structure, because the occlusal surfaces are generally already in need of attention.

Having extended the cavity sufficiently in all directions, we must use every pre-

caution with reference to the surrounding structures, in building the filling so that none of the boundary lines of the original area of liability will change. This would imply that the filling is to be properly contoured, the point of contact to be round and small, and every effort be made to prevent subsequent injury to the interproximal tissue, which should be guarded as carefully as the living pulp.

These principles are given only as fundamental laws to govern us in establishing a basis in approximal cavity preparations, and they should be supplemented by strenuous efforts on the part of the operator to familiarize himself with every condition surrounding the individual case.

It behooves us, then, as servants of our fellow man, to understand each case thoroughly, to develop the greatest possible skill we can in manipulation, and to learn to apply mechanical principles properly—that we may know to just what point, and no farther, “extension” for any purpose should be made.

PHYSIOLOGICAL CHEMISTRY AS IT APPLIES TO DENTISTRY.

By WM. H. METCALF, D.D.S., New Haven, Conn.

(Read before the New Haven Dental Association, at its annual convention, New Haven, Conn., March 15, 1904.)

IT is because there seems to be so little of practical value in print regarding this subject and its application, that I venture a few salient remarks; not so much with a view to instruct as to help open up avenues of research and instruction.

According to publications on this subject which are considered good authorities, physiological chemistry seems to be defined as a sort of laboratory action going on within the body, with corresponding results. Now, we claim that physiological chemistry is much more

than this. In the first place, it is the fundamental active principle of body metabolism—all physiological changes and activities appearing to be dependent upon or referable to it.

Our definition of physiological chemistry, if we might be pardoned such boldness, would be, that it is that atomic and molecular activity, guided and promoted by a *nexus* which has for all time, perhaps, puzzled both scientist and philosopher—which *nexus* unifies the life-principle, or spirit, with those tangible and visible forms which constitute the ma-

terial economy; thus permitting, creating, and promoting all of the phenomena which come within the scope of our subject, and effecting the divine intention, viz, Substance, Form, and Function or use.

Physiological chemistry would resolve itself into mere physical chemistry—and we say this under our breath; for what mysterious power is it, in mere laboratory chemistry, which constructs crystals, evolves heat, generates electricity, produces sound, and juggles with light and color, if there be not a living, designing principle in the occult background? Where, then, you may well ask, is the difference between the everyday chemistry of the shop and physiological chemistry? Both have startling phenomena; both have fixed laws. But a little careful thought convinces us that physiological chemistry has for its end the promotion of *function* and the metabolism of the body, finding its chief activity in the glands, and acting apparently through nerve impulse and rest—the impulse being catabolic and the rest anabolic, but both controlled by a *neurus* which seems to be the servant of a supreme and marvelous intelligence.

All bodily activity, then, is chemical, and such activity, while it wastes tissue, liberates energy through the controlled instrumentation of catabolic nerves. Also, all *rest* of body indicates chemical action, which results in the building up of tissues, aided by controlled anabolic nerves; this round of controlled activity we call metabolism, and it is, as far as we can judge, chemical action and change. When this process goes on normally, health is assured; when abnormally, disease is certain. We thus see at a glance that our subject has two aspects, one the purely mechanical, which is objective, and the other the intentional, or subjective—meaning the ultimate perfection of a plan. This latter has reference, of course, to the mysterious life-principle in chemistry; without this, chemistry would be inert. In fact, intention, which we are compelled to call life-principle, seems to dominate both organic and inorganic

chemistry. They work together as spirit and matter, and through fixed and apparently unchangeable laws—laws which although occult and mystifying seem to fit into the grand scheme of the universe, and microcosmic man.

With this inadequate idea of physiological chemistry, let us see how it applies to dentistry.

PHYSIOLOGICAL CHEMISTRY APPLIED TO DENTISTRY.

We all agree, I think, that dentistry has for its high aim the care and preservation of the teeth. How this noble privilege can best be practiced will probably always remain an open question, but in the light of recent discovery and modern methods we are all positive that conscientious dentistry includes the use of every legitimate available means, under ordinary conditions, of preserving the natural teeth. Beginning with infancy and childhood, tooth-formation first claims our attention, and here we first perceive the necessity of a knowledge of physiological chemistry. Normal nutrition should be encouraged by teaching the child to observe hygienic laws, as to food, air, study, and exercise—these of course involving proper environment.

Given these essentials, the child should be able to overcome abnormal hereditary tendencies, and arrive at a healthy normal physique, which should include also normal dentition. Here we have a theory, of course, which is wide open to discussion, yet it seems healthy and optimistic. The gates of research along these lines are wide open, for the question of heredity seems to involve evolution, and to measure the divine intention.

How far is the child a slave to heredity? Is the child acted upon by hereditary tendencies which may be modified by treatment or by the child's own will, or are these inherited handicaps of such a direct and positive nature that they cannot be overcome?

If heredity be invincible, then where is there room for race-improvement? My own convictions point to the hope-

ful view of the subject, viz, that heredity is strictly a tendency, and that every mortal possesses a god-like power of choice, either for acceptance or resistance and rejection; or, in other words, a power of *will*, which, properly cultivated, will overcome all detrimental inherited tendencies.

But you say, No man is perfect, therefore no teeth are perfect. True; but the theory of race-improvement remains, and with it hope—and without hope where are we!

The *onus*, then, of dentistry seems to lie primarily in the responsibility underlying the care of children's teeth. Much of the future welfare of the child depends upon the ultimate integrity of the teeth, involving a paramount issue to the conscientious dental practitioner. Too little is spoken and written upon this subject; and too many deciduous teeth are still sacrificed upon the altar of incompetence.

METHODS.

Now a few words as to methods.

Physiological chemistry seems to me to be the key which opens the door to a closer knowledge of the bodily economy—the physical man. We are all more or less familiar with anatomy, and with its utilitarian principle, physiology; their misplacements and functional disturbances we call disease.

We all are, or should be, more or less familiar with the various modern methods of treatment, in addition to our regular college curriculum of *materia medica* and therapeutics. I refer to those schools of practice which have obtained more or less recognition in recent years, such as electro-therapy, hydro-therapy, thermotherapy, and osteopathy, which latter should perhaps be called manual, or mechanotherapy, each containing a modicum of truth, too small perhaps for pinning the banner of faith to, and yet indispensable to the medical free-lance, in his conscientious search after truth.

Christian science, with its broad claim of the non-existence of disease, is almost too grotesque for calm consideration,

though who can deny the occult power of mind over body?

We do know, however, that normal function is dependent upon normal structure, and that any legitimate method of securing normal structure must be right, regardless of its title. The conservatism of our progressive day and generation must be based upon judgment and experience, and is not a matter of professional caste or biased sectarianism. Our method as dentists should be to select and sift the good from the bad, regardless of schools.

But I will not take the risk of tiring you with a more minute description of these methods, which seem to me but spokes in the great therapeutic wheel, only suggesting to you that the true way of selecting "the best" from the multitude of different methods of our day lies through a more thorough familiarity with physiological chemistry.

In other words, it follows that, *disease* being the perversion of function, and normal function depending entirely upon healthy or normal blood supply, an intimate knowledge of the chemistry of blood and nerve supply would seem indispensable.

Perhaps one of the greatest mistakes of modern, and of all times, has been the underrating of theory. The scientist rejects the reasonable *ideas* of the pastor or theologian, because they are not based upon or proved by his own method of material experiment. In law, there is persistent, over-persistent search for precedent. In medicine, the so-called regular, or "old school" (name archaic!) has clung to tradition, and large doses, until its position is precarious, if not untenable. The artisan is slowly evolving from the unintelligent, aye, boorish day-laborer, overworked and underfed, into a man of power and position. The "Song of the Shirt" no longer appeals to us as humanitarians. We are progressing, and the key to this progress lies through thought, through theory, through ideas.

In dentistry we have *run* where other professions seem only to have walked. What was physiology or physiological

chemistry to our predecessors of fifty or seventy-five years ago? What is it to us? Is it more than a pastime? Yes, for it means to us correct diagnosis. It also means research and discovery. Knowing then, our analysis as we should, and aided by the various handmaidens of modern treatment, we should and must

ultimately be enabled to serve our patrons more faithfully.

Then we will be able to practice a dentistry which, including an intelligent knowledge of etiology, will be at the same time prophylactic, therapeutic, and—let us hope—painless. Speed the day!

PRACTICAL PORCELAIN.

By H. EVERTON HOSLEY, D.D.S., Springfield, Mass.

(Read before the New Haven Dental Association, at its annual convention, New Haven, Conn., March 15, 1904.)

BEFORE reading my paper I want to say that I am indebted to Dr. W. T. Reeves of Chicago for some of the practical points on porcelain technic. I had the pleasure of spending some time with Dr. Reeves this winter, and I found him a generous giver from his large store of porcelain knowledge.

I feel that cavity preparation is of vital importance. Many prepare the cavity on the same lines as for a metal filling; this will lead to failure. Prepare the cavity with well-defined edges, parallel lines, and a positive seat at some part of the cavity, so that the inlay may be well seated into place.

Use the platinum or gold matrix to so cover the tooth and cavity as to be a guide in carving the contour.

Use inlay burnishers made especially for this work. Do not use makeshifts for this purpose.

Wet cotton will aid in forcing the matrix into place. Tape carried over or about the tooth will hold the matrix in place while using the burnishers.

Use a strip of rubber dam for final burnishing. This use of rubber dam I have found of great importance in perfecting the fit.

The packing of porcelain and coloring should be done in layers. Always use a darker underlying color, and work up to the shade desired. Carving and

coloring must be acquired by practical work.

I have found that the baking will prove most successful if done by time rather than by the eye. Many porcelain operators make the mistake of baking their porcelain too much. Guess-work will not do; it must be done right to get the best results.

To try in the inlay, drop a little water in the cavity, and you will have no trouble in keeping your inlay in place.

Before stripping the matrix from the inlay, dip it in water; this will facilitate its removal.

The inlay may be roughened by hydro-fluoric acid or by stones. Use the cement thin and set the inlay under pressure. Do not scale off cement until wet with the saliva. This will allow it to come away more easily.

The inlay will look much better in two or three days than at the time of setting.

Porcelain has come to stay. Many mistakes have been made and will be made in its manipulation. Mistakes are often our best teachers. I have made many in the last six years of my work in porcelain.

I believe these facts: Porcelain is the most artistic filling known; it will stay when properly placed; it will preserve teeth to an extent not yet fully appre-

ciated; it is a time-saver; it is a saver of nervous strain to our patients and ourselves. This means that you are better serving your patients, and should command a larger fee.

If you lack confidence in a porcelain inlay, it will repay you to attempt to take out a well-seated filling. As you proceed your confidence will grow, and when you have finished you will feel sure that a porcelain inlay will "stay put."

Two weeks ago I had the pleasure of operating upon a patient who presented a set of teeth very susceptible to decay.

Six years ago, Dr. Jenkins of Dresden, Germany, placed some porcelain fillings in the anterior teeth. These fillings were in better condition than any of the metal fillings in the mouth.

There is no filling but has its place in our work. Porcelain used in the places where it is properly indicated is without doubt a success, and it has raised the standard of our profession to the point where the artistic must have due consideration. Porcelain has opened the field for a higher plane of artistic achievement, and it will demand and prove its place by true merit.

INFECTIONS OF THE LYMPH-GLANDS OF THE MOUTH AND THROAT.

By **Dr. ROBERT T. MORRIS**, New York City,

PROFESSOR OF SURGERY, NEW YORK POST-GRADUATE MEDICAL SCHOOL.

(Read before the First District Dental Society of the State of New York, December 8, 1903.)

DURING the past year I have had occasion, among other things, to superintend the work of a clinic at which we see a great many patients who are suffering from infections of the throat and mouth—patients who are not subjects of careless dentistry, but who are so neglectful of the ordinary affairs of life that they do not carry out the instructions given them by their dental advisers. We also have a great many who have received no treatment for the common simple infections of the mouth that would be very readily and successfully cared for by any competent dentist.

In selecting the group of infections tonight, I have had in mind chiefly the infections of the lymph-glands, because the subject as a whole is a pretty large one, and if we include all of the infections of the mouth and throat it would occupy a very large part of your proceedings.

In speaking of the lymphatic system as a system of absorbents we are speak-

ing not quite comprehensively, because the veins also do a great deal of absorbing. The lymph-vessels all empty into veins eventually, and are simply part of the vascular system. Veins and lymph-vessels carry very much the same infections, but with different accidents in the course of infection; and the accidents occurring in the course of infection from the mouth are such as interest us surgeons very much, and dentists presumably more.

The cases we get in our clinic among the poorer class are patients, I judge, who are not often seen by dentists except at the dental clinics. I am sorry we are so busy in New York that we do not know as much as we should of each other's work. I have intended seeing dental clinic work—making a feature of it—to see the infections, but have neglected to do so; yet in the discussion tonight we shall have brought out points that are familiar to all and worthy of discussion.

THE LYMPHATIC SYSTEM: ITS DISTRIBUTION AND RÔLE IN THE PRODUCTION OF INFECTIONS ABOUT THE MOUTH, THROAT, AND NECK.

To go over the subject of lymph-vessels very briefly: We are to remember that the smaller lymph-vessels begin as simple channels between cells. These gradually become lined with endothelium and form the lesser lymph-capillaries, then passing beyond the stage of endothelial tubes finally develop lymph-vessels with muscular coat and white and yellow connective tissue, and with lymph-nodes and lymph-chambers. With the lymph-chambers we are not concerned to-night; with the lymph-nodes we are.

First let us consider this point: When the lymph-current is traveling through the lymph-vessels of the neck, the lymph is arrested temporarily in lymph-nodes, and escapes richer in albumin and salts. If bacteria be carried struggling along the lymph-current they are arrested in the reticular layer around the lymph-nodes, and if arrested long enough, and if abundant enough, they begin to proliferate, and we have the enlargement of the lymph-node—the increase of the leucocytes forming the node—until the chain of lymph-nodes is enlarged, giving us evidence of infection of the chain of glands of the neck.

When patients come to us with infections that have reached the lymph-nodes it is a matter of very nice diagnosis to determine whether the infection is from the teeth—from dead, decomposing contents of a tooth-root; from pyorrhea; from an area of superficial necrosis; from infection of the tonsil or the retropharyngeal lymph-structure; or from an infection of the palate. These are points that are not readily determined and require a very nice diagnosis, and it is certainly important for the dentist to be able to make the diagnosis well; and I am sure some of you, with greater experience, with attention directed to this matter longer than mine has been, will make the diagnosis better. I would like this point brought out in discussion.

In a general way we can determine

from what point the infection is proceeding, by noting which group of lymph-glands is chiefly involved. The deep cervical chain of lymph-nodes carries all of the lymph from the head. The sub-maxillary nodes parallel with the lower border of the mandible, before emptying into the jugular group, take infection chiefly from the anterior part of the mouth; infections of a deep cervical group of the lower carotid chiefly from the tonsil, and the infections of the sub-mastoid group chiefly from infections of the ear.

Some of you may not believe this grouping to be important in a diagnostic way; but I believe it is, because assistants first coming on my staff do not readily make the diagnosis of the point from which infection is proceeding, and it makes a great difference whether we begin work on an ear, on a tonsil, on the retropharyngeal lymph tissue, or upon the teeth. We are finding in my clinic very many more infections proceeding from the teeth than are found in some other clinics. A good many infections of the floor of the mouth begin from a focus in a simple pyorrhea—pyorrheas that are so common among the lower classes, among people who do not take care of the teeth, and these infections are apt to be passed off as something more serious by physicians. I presume dentists recognize them very readily, but as a rule infections of the floor of the mouth are not attributed by physicians to a focus of infection about the teeth.

LUDWIG'S ANGINA.

A very common one is called Ludwig's angina. Cases of that kind with infiltration of the floor of the mouth without acute onslaught, not readily responding to treatment of any sort, very commonly arise from a focus of infection about the root of the tooth—not in the roots, but in the gingival membrane. These cases are apt to be subjected to surgical operation. Incisions are made and the patients are treated with ice and heat—all unsatisfactory, because the point of in-

fection is not recognized; and we must be on guard always when a case comes in with infiltration of the floor of the mouth, general involvement of the lymph-glands of the floor of the mouth and of the subhyoid group—we must look for infection from the anterior part of the mouth, preferably from the gingival membrane rather than from the interior of the tooth-root. When we have infection from a tooth-root we are more apt to have acute onslaught, formation of fistula, and abscess without wide involvement of lymph-glands. The infections involving the lymph-nodes of the neck do not so often apparently proceed from infection of the tooth-root, but do commonly proceed from infection about the teeth.

When the group of glands of the lower carotid triangle is involved we may look for infection from the pharynx and may usually leave out the teeth altogether. In tuberculosis we generally have the group of glands behind the sterno-cleido-mastoid infected. The cases have not been well classified in our clinical records, and it is a nice distinction to make.

A CLASS OF INFECTIONS FREQUENTLY OVERLOOKED.

One class of infections, very dangerous ones, have been frequently overlooked by dentists—not from any fault of theirs, but because patients have not followed instructions to return for treatment. These are infections following the removal of abscessed teeth. Patients die and the cases are not reported; they come in to be treated for pneumonia. There are patients dying this minute in this city from the result of having abscessed teeth extracted while in the course of acute infection; there are cases dying continually in this city—not recorded and not discussed, for the reason that they are entered at our hospitals as cases of pneumonia; but they are cases of septic pneumonia, embolic pneumonia, resulting from infection from abscessed teeth. Very often the dentist knows nothing about it. He removes a tooth;

he hears, four or five days later, that the patient has developed pneumonia—believes it to have been a coincidence, thinks his part in the case is not one of consequence, and the patient dies. The case is recorded as a death from pneumonia—not as septic pneumonia from an abscessed tooth. If one's attention be attracted to it, he will find many of them. I have frequently seen cases of most violent infection, of which the dentist who removed the tooth knew nothing. The physician caring for the case would seldom trace the case back, and the simple statement of the patient that he had an abscessed tooth extracted a few days previously was not held to stand in any causative relation to the condition.

I judge when an abscessed tooth is extracted during the progress of acute infection, little harm results ordinarily; but in these cases we have thrombi in the veins of the cancellous structure of the bone about the tooth, and when the tooth is extracted, if the cancellous structure of the bone be crushed but very little, the thrombi of the veins and lymphatics may become emboli, and we have embolic infections coming on and making their greatest demonstration three or four days after the accident has happened, and insidiously, not seeming to bear any relation to the real cause.

There is an old saying in surgery that we find whatever we are looking for. I am sure that dentistry, as a part of surgery, will come under the same rule—that a dentist will find almost anything he looks for.

When an infection is proceeding acutely, either from the interior of the tooth-root or the gingival membrane, the bacteria proliferating rapidly and before protective leucocytosis has become established—then is the time when we are to be most careful about doing meddlesome work about the focus of infection. After an infection has been under way for a few hours, if the patient has good powers of resistance and has called out a well-marked local leucocytosis, the infection is met. The bacteria and the leucocytes in their struggle side by side have their fight out, the leucocytes win, the bacteria

are vanquished, and at that time, even although abscesses may be in evidence, although infiltrations about the neck and the mouth may be marked to a degree, we can go ahead. This is an important point I would like to make—to avoid doing any operative work about a focus of infection in the mouth while bacteria are actively proliferating, and before leucocytes have met and vanquished them. That point can be determined by cultures or microscopical examination. Many a time I have sent my slides to the laboratory and have found that the bacteria were dead, the fluid was sterile, and it was safe to go ahead. If I had done anything twenty-four hours previously, I might have set up a dangerous infection that would have been hard to control.

STREPTOCOCCUS INFECTIONS THE MOST COMMON FORM—TREATMENT.

A great deal depends upon the form of infection. I find a great deal more infection from streptococci than from any other bacteria in this infection. The streptococci are particularly dangerous during their stage of proliferation—they infect widely, and they dam the lymph-nodes so that abscesses form in the neck, in the floor of the mouth, about the throat, and it is a very important thing to know what to do for those cases and the time for doing it. It is important to distinguish between the stage of active proliferation and the stage when the bacteria have been vanquished. During the stage of active proliferation, ice is frequently applied by dentists—perhaps just as often by physicians—wrongly. It gives comfort to the patient, takes away the unrest that makes a patient call for your services, and yet does not limit infection or change the character of the process much. The use of ice for limiting an acute streptococcus invasion may postpone the time when danger is to come. It is not the quieting of the swollen tissues about the jaw with ice that is called for; it is increasing the power of the patient to manufacture more leucocytes—general tonic treat-

ment, treatment that shall distinctly increase his cell-resistance. That varies with the individual; we all have different degrees of cell-resistance. One man's cells are readily attacked by bacteria; another man's are not attacked at all. In one case, if a man be below par in health, his cells become vulnerable, they do not resist, and that day or that week he is open to infection. One who has been suffering from an abscessed tooth with neuralgia, with pain, may not resist well. The important point of treatment is to increase his general power of resistance, and give more attention to that than the local treatment. Better give him whiskey and quinin, and open air, and horseback exercise every day than to put him in bed and put ice on the area that is undergoing acute infection.

The same is true of the application of heat with poultices. I have patients coming in frequently who have been poulticed; it did relieve the irritability and restlessness of the patient, and yet it was not the best treatment, for it postponed the evil day.

THE QUESTION OF COLD OR HEAT IN TREATMENT.

I recently heard a discussion as to whether it were better to apply ice or hot applications in an acutely progressing infection—streptococcus invasion. That is a matter that goes with individual patients; one receives comfort from cold applications, another from hot ones. The only way to know is in the early days of one's practice: When a patient comes in calling for immediate relief from suffering, and the young practitioner applies cold applications, he may be sure that the patient cannot get comfort excepting from hot ones!

I saw a case, recently, of infection from an abscessed tooth; the lymph-glands about the floor of the mouth were involved. Ice had been kept on almost continuously for two weeks, the case not having been seen by a physician. The dentist had advised ice applications. The case is now one of chronic infection.

There will always be a thickening of the floor of the mouth; the patient will always have difficulty in speaking well; he will always have a thick speech and awkward movements of the mouth and throat—for the single and simple reason that ice was applied for two weeks to control that condition. If no ice had been used in the case at all, that patient in all reasonable probability would have been perfectly well today.

Infections from the staphylococci do not so often result in abscesses of the throat and beneath the mandible as infections of the lymph-glands and lymphatics from streptococci. The treatment does not always take into consideration the bacterial invasion.

SOME THINGS TO BE AVOIDED.

It is important to avoid scarring. The opening of the abscesses is done personally by some dentists, and by others referred to surgeons; but many times I have seen cases at clinics where abscesses of the floor of the mouth had been opened with a rather long incision. We were certain to have an unsightly scar, which was unnecessary, because at the time when the abscesses are formed from infected lymph-glands in the floor of the mouth and the throat the fluid soon becomes sterile, as a rule, and we need not make a long incision for emptying these abscesses. That is a point which is overlooked. It is not discussed in the journals, and not spoken of in general conversation. We need not make a large incision for the purpose of evacuating the pus. With a small trocar needle we may draw off part of the fluid contents, wait three or four days, withdraw a little more, and so on. You will be surprised to see that meanwhile the lymph-vessels are taking up the fluid themselves; there is less fluid each time and repair will go on without scar formation, if we withdraw the pus through a small needle, a little at a time, from an abscess that needs evacuation. When an incision is made and the abscess is evacuated, the tendency is to make pressure on the abscess wall—by everyone who has not had

an abscess himself. The collection of fluid is surrounded by a pyophylactic membrane or by the products of leucocytes protecting the area. If we are very careful not to press out the pus, not to make any pressure upon the tissues, the case will run its best course. Nature gives us a clue, in our feelings; anyone who has had an ordinary abscess does not dread so much the incision as the pressure made immediately afterward with the fingers. We dread the pressure; it is more painful and spreads the damage, and is not the thing to do. The latent bacteria may be aroused if we do the wrong thing—and the wrong thing is usually done. We also feel that we must wash out all the pus and do something to the floor of the cavity. These cavities are often washed out with hydrogen dioxide. Hydrogen dioxide is very valuable in its place, but if the collection of fluid be sterile, it does damage. It attacks the wall of leucocytes, breaks them down, and you can get a new invasion after the use of hydrogen dioxide. By using it when granulation is under way we may destroy the granulations; in this way a most valuable and useful resource is very commonly used wrongly—still holding to the wrong idea that we must get the interior of the abscess clean. It is a gross idea of cleanliness, an idea that would appeal to your kitchenmaid—if you have the luck to have such a kitchenmaid. The gross idea of cleanliness is one that appeals to most of us naturally; there is a feeling that we must get all that pus out. But there is nothing to that pus; it is most bland, and usually sterile, and altogether a most delightful thing to have in that cavity. Let the tissues gradually contract about the cavity and force the pus out without the formation of connective tissue that would later contract and make an ugly scar. The more we disturb this area the more connective tissue we will have and the greater degree of contraction will follow, such as always occurs in new connective tissue. The contraction and the scarring result from the meddlesome treatment that appears to most physicians—I hope not to most dentists—to be necessary!

TUBERCULOUS INFECTION.

The infections of lymph-glands occurring in actinomycosis or from the pneumococcus I need not discuss, but the infections that go with tuberculosis must be separated from those that go with acute infections from the floor of the mouth. But this is not easily done; I have had to make sections, or cultures, to determine whether we were dealing with tuberculosis or with an infection from the tooth-root or the gingival membrane. It is not always easy to distinguish between tuberculous infections of the lymph-glands of the mouth and throat and infections from the staphylococcus, streptococcus, and other bacteria. With tuberculosis, however, we are apt to have a previous history that gives us a clue—a very slow involvement of a large number of glands in a mild way at the outset, and gradually slow development and increase of the infected glands without marked swelling or redness or pain—without evidence of acute progression of infective invasion. The glands gradually become enlarged without very much attention being attracted to them. In tuberculosis we are almost certain to have at the outset a group of glands to the outer side of the sterno-cleido-mastoid involved. That is so common that we are not likely to make a mistake. And yet I did so recently in two cases; I thought I was dealing with pyorrhea and found that I had tuberculosis. They are going to get well, too—those two cases. In many of these tuberculous cases the patient dies; operation is useless, we can-

not save them. There are many cases, however, that will respond to iodoform injections, and in those two instances that I found to be cases of tuberculosis in the floor of the mouth, after first thinking them cases of tooth-infection, we have been injecting iodoform and ether, each gland separately—a drop of cocain first, then iodoform and ether—picking out two or three glands at a time, and injecting at intervals of three or four days. That treatment will occasionally be effective, and when it is we are very fortunate.

SPECIAL NEED FOR DEVELOPING CELL-RESISTANCE.

Meanwhile, in this infection of the lymph-glands of the floor of the mouth we have particular need for developing the patient's general cell-resistance. Instead of putting him in bed, give him quinin and wine and roast beef and good things. Let him stay out of doors, play golf, and go fishing and shooting (and send us the game). Let him do all the things that develop general cell-resistance. Do not put him in bed and put your finger on the infected glands, and say, We are to focus our attention upon his glands; for our focal range is too short, and we do not take in the whole patient! In dealing with infections of the lymph-glands of the floor of the mouth and the throat, let our range take in the entire patient, and "relax our accommodation," as the ophthalmologists say, when looking at the glands themselves.

PROCEEDINGS OF SOCIETIES.

NEW HAVEN DENTAL ASSOCIATION.

First Annual Convention.

THE first annual convention of the New Haven Dental Association was held in Harmonie Hall, New Haven, Conn., March 15 and 16, 1904.

FIRST DAY—*Morning Session.*

The first session was called to order at 10 o'clock Tuesday morning by Dr. F. W. Brown, New Haven, president.

The meeting was opened with prayer by Rev. W. L. Phillips, D.D., New Haven.

An address of welcome was made by Hon. J. P. Studley, mayor of New Haven, following which the president delivered his annual address.

The regular order of business was taken up, and Dr. W. H. METCALF, New Haven, read a paper on "Physiological Chemistry as It Applies to Dentistry." (Printed in full at page 445 of the present issue of the *Cosmos*.)

Discussion.

Dr. J. E. HEYKE, New Haven. This is a difficult paper to discuss, because the essayist has not restricted himself to the subject of his paper. The definition given by the essayist of physiological chemistry I do not think is a good one, because he admits a factor that does not belong there. I think the accepted definition of physiological chemistry being the chemical changes which take place in the great laboratory of the body is a good one.

Now, if you define physiological chemistry as also comprising occult forces, spirit, or soul, or whatever you choose to call it, you will be drifting into metaphysics. Physiological chemistry is

simply the reading and understanding of the actual things that we can see and know, connected with the metabolism of the body, without any doctrines or theories of the manifestation of spirit over matter. That we will cheerfully relegate to the region of Herbert Spencer's "unknownable."

The point the essayist made with regard to heredity is rather strange to me. Heredity, of course, is a very important factor in life, and we are all subject to it. The question of whether it is invincible or not, I think is simply a matter of whether the opposing force is strong enough to overcome it. I believe that we are all subject to a great number of forces, and I believe the strongest ones become predominant in character and physical development. The god-like power of choice, mentioned by the essayist, I do not think we have any evidence of. No matter how much you develop a man mentally, unless it is in him to do right, he won't do right.

The conclusion of the essayist, that dentistry can be practiced painlessly by understanding physiological chemistry is a little far-fetched. Of course, in order to understand the phenomena of life, knowledge of physiological chemistry is indispensable, but I do not see how any amount of knowledge of physiological chemistry or anything else would ever enable the dental profession to practice dentistry painlessly, because we are dealing with nerves, and as long as we have a nerve, that nerve is going to hurt if you touch it. I cannot conceive of painless dentistry being accomplished unless you put the body to sleep or put the

parts to sleep, by the use of general or local anesthesia.

Dr. HENRY McMANUS, Hartford. I will not attempt to discuss the first part of the paper, but the latter part I think from the impression I received from the reading of it seems to be not only trustworthy, but very practical.

Personally, I believe that within a very few years the microscope and test tube will lead us to absolutely painless dentistry. The suggestion that we are working on living nerves all the time I do not quite agree with, for I do not believe that all the dentists in the world are killing all the pulps they can get their hands on. Much of the pain of dentistry is caused, I think, by heavy-handed carelessness on the part of the operator, and a lack of local anesthetics properly used.

Dr. A. H. MERRITT, New York. I think the point made by the essayist in reference to a better knowledge of physiological chemistry a very important one. I feel that we as dentists are altogether too prone to limit our observations to the mouth. I believe that the more complete is our knowledge of the processes taking place in the alimentary canal—the process of digestion, assimilation, and nutrition—and the sooner we realize the importance which these play upon the field to which we as specialists confine our attention, the more satisfactory will be the service that we render to our patients.

Dentistry is not solely a problem of mechanics. It is natural that in this, our chosen field of endeavor, we should be called upon daily to perform operations in which there is much that is mechanical—for this is true of all forms of surgery—and it is necessary that we bring to these a high order of manipulative skill; but the highest service in this direction can only be rendered by him who most clearly understands the remote causes back of each individual case. As Dr. Kirk has shown, malnutrition may exist without the knowledge of the patient, and such malnutrition manifests itself in the oral cavity. This being true, I believe that a better knowl-

edge of the nutritional process and the important rôle which it plays in the tissues coming under our observation will make us more efficient in the treatment of those pathological conditions that are daily presenting; and this is especially true in disease of the gums and periodontal membrane.

I believe also that dentistry is not necessarily as painful as the public are prone to believe, and that too many of the charges of this nature which are brought against our profession are attributable to carelessness on the part of the operator. With proper instrumentation and the thoughtfulness which we owe to our patients, I believe that the pain of dental operations can be reduced to a minimum. Every operator should strive constantly to improve his technique, and at the same time use every opportunity to disabuse his patients of the popular notion that dental operations are of all things the most painful.

Dr. METCALF (closing the discussion). Only one word in answer to the criticism of Dr. Heyke, which seems to be pretty well answered already; that is, in regard to the metaphysical aspect of my paper. That is the one point which I tried very hard to eliminate, and I think if Dr. Heyke reads the paper, should it be published, he will find that to be the case.

In regard to heredity, of course every idea that I advanced the medical journals will confirm, for they were the source of my inspiration. With regard to painless dentistry, I would like to agree with the last speaker. My practice every day confirms me in the belief that we are not yet ready for painless dentistry, but, as I said before, it must come from therapeutic means and from a knowledge of physiological chemistry. My main point was to emphasize the importance of attention to children's teeth, because in children are rudimentary conditions to be more closely observed, and through the children we are to get what we are working for—normally perfect teeth. In fact, many social, political, and mental, as well as physical problems, are to be solved, and are being solved today, through a closer study of the child.

On motion the subject was passed and Dr. H. E. HOSLEY, Springfield, Mass., read a paper on "Practical Porcelain." (Printed in full at page 448 of the present issue of the COSMOS.)

Discussion.

Dr. HENRY McMANUS, Hartford. I regret very much that Dr. Capon and Dr. Marshall are not here to open this discussion as properly as it should be. I do not consider myself a skilful inlayist, but I do attempt to do porcelain work, not to the exclusion of other filling materials, but whenever I think it necessary. So many of the profession have looked at porcelain work as a specialty that could and should be practiced only by the most expert in the profession, that the little I have endeavored to do outside of the office is to popularize the inlay in the mind of the average dentist, for I believe there is not a man in this room who, if he goes to work with porcelain in the proper manner and is not color-blind, but can get, within a very short time, excellent results. I myself thought, when I began this work in 1889, that it took an unusual amount of skill, but today I am as firmly convinced that it is no more difficult than to solder a backing to a tooth.

The claim that the inlay has come to stay has been demonstrated, and if we do our work as it should be done, we have made an advance in artistic dentistry. I will say more than that; I think the porcelain inlay is the only thing in operative dentistry that we can really call artistic. There is no color more conspicuous than yellow. There is nothing artistic in pounding a lot of yellow gold into a tooth, and we have no reason to pat ourselves on the back for artists when we are only skilful metal-workers. I have sat in the theater and examined beautifully-finished big gold fillings in the teeth of singers twenty feet away. A bad inlay—a really bad inlay with saw edges—would have been far more artistic. As a tooth-saver I think the inlay has a great future. I have never seen recurrent decay around the edges of an inlay.

Dr. R. OTTOLENGUI, New York. I did not hear the paper, and if I say anything in opposition to the ideas of the essayist, I do it innocently. Porcelain, gentlemen, has come to stay, and yet in my practice porcelain is not occupying that exalted position for which it seems to have been intended and for which it is advocated. Now, you hear a great deal about not being able to get the correct color. In the majority of places where I put porcelain the color is of no consequence; if I get a fair match it is satisfactory. I do not mean to say that there are no places where color is essential, but the point is this, that if we make a scientific study of dentistry the primary impulse is the wish to avoid pain, and coupled with that is the desire to prevent the loss of tooth-structure.

I take it that the most important function of the dentist is to preserve the teeth. We have teeth coming to us in certain conditions that, as Dr. Flag would have said, need saving more than others; that is where caries has progressed down to where the pulp is not absolutely exposed, but where it is in great danger of being exposed. I know very well that the present teaching is that we should be able to take out the pulp and leave the tooth in a good healthy condition. I admit that we all should be able to do this, but we are not always sure that we can do it, and we feel it our duty to save the pulp if we possibly can, while restoring the tooth to its normal form and usefulness, and the filling material which will do that will be our friend. That is where porcelain comes in. I am using porcelain for that purpose with molars and bicuspsids and in posterior parts of the mouth. Recently I put in an inlay in the third molar tooth in which the pulp was nearly exposed. I have put these inlays in very inaccessible cavities where the tooth was very sensitive and painful, and yet at the same time where the pulp was not endangered. Such cases demonstrate this much at least: that it is not an uncertain filling material. I had a case recently of a posterior approximal cavity in the lower second molar; adjacent to it was

a gold crown. There had been lodgment of food between the crown and the tooth which had caused decay in a concealed place, which was not noticed until I found it. Extensive caries was present. The tooth was abnormally sensitive, so much so that it was impossible to cut toward the pulp to make a seat for gold. The putting in of a gold filling from a purely mechanical standpoint seemed almost impossible, besides the pain it would have caused to the patient to make the undercuts. I temporarily restored the tooth with gutta-percha, and it remained comfortable for two weeks; and therefore I placed a porcelain filling at the end of that time without killing the pulp. I prepare such cavities with gem stones made by The S. S. White Co. They are very small and in a short time you can have a very excellent selection, as when they wear they can be used for preparation of even very small cavities. Gentlemen, I think this is the greatest use to which porcelain can be put, because it combines the esthetic and the absolutely useful, and is the salvation of the tooth where you would otherwise have to put in a temporary filling, which will gradually fail, and your endeavor to postpone the death of the pulp will meet with but temporary success.

Dr. C. F. BLIVEN, Worcester, Mass. I am not prepared to discuss a paper which I have not heard, but I understand that the subject before the association is porcelain. This subject seems to be very strongly before the entire profession at the present time.

That porcelain is something more than a fad there is no doubt, from the fact that it sprang into life about sixteen years ago, and since then has rapidly increased in use. Appliances and materials have been developed until a man with fairly good mechanical ability and with sufficient of the artistic in his nature can do very creditable work. Of course the rank and file have only three or four years' experience in this work, and I think there are many finding its limitations, especially at the cervical margins of bicuspid and molars. While it is exceedingly difficult to make a good

cervical margin with any material, I think it is especially so with porcelain. There are many operations that we can, and many operations that we cannot do, and when we find our limitations and keep within their bounds, our work in any line will be permanent—and permanence is the main incentive to every man striving to do good work, whether with porcelain or any other material.

About twelve or thirteen years ago I went to a meeting in Holyoke for the purpose of seeing Dr. Land, to whom credit is due for introducing porcelain to the dental profession. I had one of the first furnaces he put on the market, which made it practicable for us to make porcelain fillings. I think the men who had those furnaces know a little something of the difficulties of the times. At that meeting I met Dr. Capon—who should have been here to discuss this paper. He saw the work done by Dr. Land, and turning away in disgust he said to me, "I don't think I want any of that in mine." After two hours' talk with Dr. Capon, he returned to Philadelphia and took up porcelain work, and all who know him know his ability in that direction.

What I am trying to point out is the limitations in porcelain work. Two years ago I met Dr. Capon again in Boston, where I was giving a clinic demonstrating the filling of badly broken-down molars and bicuspid with amalgam and cement. Dr. Capon watched the operation, and when it was finished, said, "Bliven, I am going back to Philadelphia and am going to use amalgam. Any man who can do that kind of work in the back of the mouth will do less work with porcelain." I speak of this, gentlemen, for the purpose of calling your attention to the limitations of porcelain as well as other materials. You will find some things you can do and some you cannot. Confine yourself to the things you can do, and porcelain will undoubtedly prove successful in your practice.

Dr. I. B. STILSON, Stamford. There is one point brought out by the essayist, and one by Dr. McManus that I think worthy of emphasis. The essayist re-

ferred to the fusing of porcelain by time rather than by the eye. I have found it much more satisfactory to fuse by time than by the eye. By a little experimenting and watching it, I find that I can tell within two or three seconds of the exact time when the porcelain will fuse. And two or three seconds will make very little difference in the result. The point brought out by Dr. McManus is that any man can learn to do porcelain work. Any man who is capable of practicing dentistry can learn this work. From my experience I believe that any man who cannot learn this work has no business practicing dentistry; but it cannot be learned in a day. Much careful and painstaking effort is required, and unless one is willing to give the time to it, he had better leave it alone.

Dr. OTTOLENGUI. The discussion of the fusing-points of porcelain reminds me that in my mail this morning I received a letter from Dr. W. A. Price, Cleveland, in which was a picture of a new furnace he has invented with a pyrometer attached. The scale on the pyrometer is arranged so that it registers the point at which a certain body will fuse; for instance, a certain point is marked Brewster's, and at that point the Brewster body will fuse. Remarking on what he has been able to do with this furnace and pyrometer, he says he has been able to get exactly the same color of a body numbers of times in succession by following the points of indication on the pyrometer. It seems to me that if what he says of the furnace be true we have reached the millennium in the matter of furnaces.

Dr. W. A. CAPON, Philadelphia. I have had the pleasure of using one of Dr. Price's furnaces in my office in Philadelphia, but unfortunately I have not been able to get the results that Dr. Price has, because the instrument is a very delicate affair and was injured in shipping. I am to have this same furnace to give a clinic in Philadelphia to show the working of the furnace. I am very much interested in it, because it seems to be a good thing. Of course the figures of fusing on the pyrometer scale are

taken from the tabulated list of fusing-points which he has previously published. He told me that some time ago. They are taken as a standard. Outside of the pyrometer, Dr. Price has succeeded in putting on the market a very simple and cheap furnace. The pyrometer is a very beautiful affair, and very beautifully finished, and I believe in the working of it because the inventor is a man of his word in every respect. I am afraid, though, that it will never be very extensively used because it will be too expensive. The furnace itself is very cheap, but the pyrometer costs a great deal more.

Dr. C. F. ASH, Brooklyn. Dr. Ottolengui suggests that I tell you something of mixing colors with the Jenkins body. I heard a remark last night from one who is a very prominent man in porcelain work and who has done considerable work in this line from the time the method was first brought out. He said he had little difficulty in getting the colors in his porcelain work, but he could not "get a joint" to suit him. I said to him, "If you will get the colors, I will make the joints." I do not have any trouble in getting the joints, but I do have trouble in getting the colors. The margins of the porcelain come always easily and accurately in apposition to the margin of the cavity. The only trouble I have is in getting the right shade. I think that in a properly prepared cavity it is a very easy matter to get close adaptation. The difficult problem is to get the right shade of porcelain, there being sometimes three distinct colors in a tooth, requiring a great deal of skill and experience to so blend the colors of the porcelain that the inlay will not be conspicuous when set. I started with the high-fusing bodies, but since learning something of the low-fusing bodies I have used them entirely, and they have proved very satisfactory. I have seen many men using the high-fusing bodies, and I believe I know how to handle them, but I can get as good, if not better, results from the Jenkins body. I use the gold matrix and the gas furnace.

Dr. CAPON. I have not so much

trouble getting the proper colors as in getting the proper joints. If you get a proper joint on a central tip, and where there is a cavity on the mesial and buccal side of the same tooth, then I will take my hat off to you. In a cavity such as I speak of, where you have very little space between that and the adjoining tooth, I do not think it is quite easy for anybody to get a joint there, no matter whether gold or platinum be used. These are the cavities where the greatest skill of the porcelain-worker is required. I doubt if anyone has done more work in this line than I have, and I admit that I have trouble in getting the joints in these cavities just as I want them. I can say as to porcelain work in any branch, it is not always easy.

Dr. HOSLEY (closing the discussion). I have nothing to add to the remarks made in the paper, except to offer a little criticism: I think the discussion was a whole lot better than the paper. It has been a source of a great deal of pleasure to me to feel that a little paper like that has brought out such a good discussion.

On motion the subject was passed, and the meeting adjourned until the afternoon session.

FIRST DAY—*Afternoon Session.*

The afternoon session was called to order at 3 o'clock by Vice-president Dr. E. S. Gaylord.

Dr. G. LENOX CURTIS, New York, read a paper on "Surgery of the Mouth." (Printed in full at page 437 of the present issue of the COSMOS.)

Discussion.

H. L. SWAIN, M.D., New Haven. It is quite a task to undertake to properly discuss a paper like the one just presented by Dr. Curtis. The greatest difficulty in my case is that the second part which he has brought before you is something with which I am unfamiliar except in a purely clinical way, as I observe it in the mouths of patients; so, if I avoid the latter part of his paper in the dis-

cussion, I hope I may be pardoned. Regarding the first part of the paper, I think we all should congratulate him for being able to display that exceptional skill which enabled him to handle the case so successfully, after the patient having gone from person to person and having been treated in the way he had been. There is nothing to discuss in the surgical part of his paper; he cured his case, and if we do that we are successful. We who are in this line of work are meeting cases like his where we see failures in diagnosis, and where perhaps we have the good fortune to discover the cause and correctly treat the case. The treatment seems to fall under two divisions—the strictly dental and the strictly surgical. Dr. Curtis has united the two departments in a very skilful and successful way. There are few dentists who have sufficient experience to be willing to bore out a whole antrum and clean and treat it in the way the essayist has done. I am sure that few of us who are concerned in the treatment of the nose and throat have the necessary dental skill to extract a tooth, to say nothing of the other work done. We in New Haven, when we make a diagnosis, let the dentist do his part and we try to do the strictly surgical.

I recently had a couple of cases where the destructive process of alveolar abscess of the central incisor had led to an opening in the floor of the nose. That is, the alveolar abscess opened through the nasal side of the maxillary bone instead of on the palatal side, and resulted in nasal stenosis. There was nothing to be done in the treatment but to have the dentist remove the carious process from around the roots of the teeth. We have succeeded in curing the two cases. They being the only cases that I ever saw of that character, I should presume that they are rare. I should, however, be glad to hear from Dr. Curtis as to whether he often sees that form of alveolar destruction which encroaches upon the floor of the nose. I have had a case also where osteoma was present in the maxillary antrum, and where it required a great deal of surgery to accomplish a cure by

the ordinary methods of the nasal surgeon.

The essayist is also very fortunate in that he was able to use with skill the dental drill instead of the chisel more familiar to us. With reference to the case cited where a tube was lost on the palatal side of the bone, it occasionally happens that tubes get lost, but I have never lost one in that way. I have seen cases in antral disease where the tube had slipped up into the cavity. These have been recovered after a great deal of effort, and the cases cured after removal of the tube.

Dr. H. L. WHEELER, New York. I would like to ask Dr. Curtis how he tells by the examination of the blood that a patient has syphilis. That part of his paper interested me very much, and I would like to say before I sit down that I do not agree with him, with my limited knowledge of the disease, that any large proportion of cases of suppurative gingivitis or pyorrhea come from syphilis. I should need to have better evidence than has yet been presented to convince me that even a small proportion comes from syphilis.

R. A. McDONNELL, M.D., New Haven. I have but little to say on this subject. I see a good many cases of syphilis, but the forms are not those presented in the paper. I see many mucous patches, ulcerations of the tonsils, gummata of the tongue and the tonsils, etc., and even chancres of the soft parts of the mouth come into my work, but I do not know much about suppurative diseases at the roots of the teeth. I do not recognize that as a part of the syphilitic phenomena.

Dr. CURTIS. Will you tell us something about the germ of Vincent.

Dr. McDONNELL. I have nothing special to tell you in reference to this germ. A good many germs have been discovered which at the time have been considered the cause of syphilis, but the opinion at present is that the syphilitic germ is not yet discovered. That the disease is caused by a germ is, I think, generally believed, but I do not believe the germ has yet been discovered.

H. C. BOENNING, M.D., Philadelphia. Dr. Curtis' paper opens a broad field for discussion. In treating cases of antral empyema it has been our practice to raise a periosteal flap over the anterior antral wall and open the antrum sufficiently so that the finger can be introduced. We often find within the antrum masses of debris, shreds of tissue, dead bone, and inspissated pus; sometimes in long-continued cases the contents of a diseased antrum form calculi, some large specimens of which we have removed. This is the only rational treatment of antral empyema. By thus opening the antrum you evacuate it of its pathological contents, and remove all diseased bone and tissue.

Projecting diseased roots can be readily removed. In fact, a large opening into the antrum brings that cavity entirely under surgical control. I consider the frequently practiced method of removing a tooth—often a sound one—and opening through the socket, unjustifiable for two reasons: You destroy a dental organ, and you fail to bring the antrum completely into the field for surgical treatment. We find that at the Garretson Hospital about six weeks are required to cure such cases. I do not approve of opening the antrum into the middle meatus by a large opening, as is practiced. Such operations in my experience do great damage, and simply convert the antrum into a nasal cesspool. Mucus accumulates, bacterial development takes place, and in a little time free suppuration occurs, often destroying the antral mucous membrane and infecting the bone. It has been suggested to make two large openings, one through the anterior antral wall and the other into the nose. This, again, I think bad practice, for if the opening into the antrum through the anterior wall be large enough, there can be no possible excuse, for the purposes of treatment, for a large nasal opening.

Pyorrhea alveolaris the essayist defined as a suppurative and a non-suppurative disease. Pyorrhea alveolaris is always a suppurative disease. The name itself means a flow of pus from the alveolar

process, and it is always due to one thing, and that thing is a pus germ. If we have not the pus germ we have no pus. You may have pyorrhea alveolaris in the alveolar process where the teeth have been extracted, and where the sockets of the teeth remain and become infected. It is taught that serumal calculus is the cause of pyorrhea alveolaris. I grant you that in many cases serumal calculi are present, but it is only the opening of the door to the pus germ. No one germ is responsible for pyorrhea, but we have to admit that it is due to a variety of pus germs, as can be readily proved by cultures.

With reference to the essayist's remarks on syphilis, I would say that we do not know whether syphilis is due to a vegetable or animal micro-organism. There have been a great many germs advanced from time to time that were supposed to be responsible for the various evidences of syphilis, but no one germ has been proved to be responsible for the disease. We all believe, however, with Lustgarten, that it is due to a germ. The statement of the essayist that cases of pyorrhea in which there were discharges of pus from the alveoli were due to syphilis, I cannot accept; for, as pyorrhea alveolaris is always associated with a flow of pus from the alveolar process, it would be equivalent to saying that all such cases are due to syphilis. Syphilis, when a factor in this disease, is coincidental. The diagnosis of syphilis is generally easily established. I have never found a man who when properly approached and examined would resent the inquiry. I do not remember in my experience seeing a case of pyorrhea due to syphilis in which there were not other mouth-lesions of syphilis present.

In his treatment of pyorrhea the essayist suggested a certain line of treatment that when carried out would lead to a perfect cure. But how is this to be carried out? It is a very difficult thing to do, when you remember that in the lower jaw there are sixteen sockets, and that the inferior maxilla is the least vital of the bones of the face. It is less resistant to disease, has less arterial vitality, and

consequently we can readily understand how purulent infections about the lower jaw travel through the cancellous structures of the bone and establish themselves in the alveoli, and we can also readily understand why this disease in the lower jaw is so difficult to eradicate. The germs pass from one space to another, with the result that the morbid action is not confined or limited. In some cases the entire bone becomes infected. A very excellent line of treatment is by the use of the flat-nozzle syringe that conforms to the shape of the teeth, and the flushing of the alveolar structures of the maxillæ with normal saline solutions and mild but efficient antiseptics. There is something else useful in the treatment of this disease, and that is antitoxins to prohibit the development of the organisms. The use of anti-streptococci serum, in my judgment, is indicated.

Dr. Curtis has presented many valuable points of interest which should receive the most careful examination and inquiry on the part of the dental practitioner.

Dr. CURTIS (closing the discussion). Answering Dr. Swain's inquiry with reference to nasal fistula: I have found a large number of these cases, comparatively speaking, inasmuch as I am doing surgery of this class only, and cases are sent to me by both the medical and dental professions. But it would be quite different in a general practice, or with a man confining himself to nasal work. The method of syringing I think should be abandoned. I do not know anyone who is successful in the treatment of abscesses of the antrum by syringing. I usually see these cases after they have been treated from one to six years, and I then operate and get good results. I once treated antral cases that way, but I never do it now and have not done so for the past eighteen years. Prior to that time I treated them as the dentist does. Some of these cases I afterward operated upon to procure results.

Dr. Wheeler asked the question how I could find syphilitic spores by examination of the blood. It is a very easy matter. If you place the fresh blood under

the microscope you can easily find them, if you can see, and know what you see. The syphilitic spores are as plainly to be seen as the red blood corpuscles, and they are always present in a patient who has hereditary or acquired syphilis. I have found them in probably 1500 cases which I have examined. Twenty-two years ago I took up the study of pyorrhea alveolaris to ascertain the etiology of the suppurative theory, and during that time I examined somewhere in the neighborhood of fifteen hundred cases. Then I read a paper. It took me eighteen years of study before I dared to read a paper, and have it published, saying that I had discovered the cause.

I have differentiated between suppurative and non-suppurative as two different varieties of the disease. Suppurative gingivitis, or pyorrhea, is the first general symptom of pyorrhea alveolaris. In a large percentage of these cases there is syphilis present. On that point I will refer to a case that came to me one week ago to have a lower left first bicuspid treated. Two dentists had been treating this for two and a half years, and the treatment from which the patient had derived the most benefit was that of iodine applied to the gum. On examination I found that the adjacent molars and bicuspids were very badly diseased. The alveolar process and the soft tissues were also badly affected. I arranged for an operation, and asked the patient to return to his dentist and have him take out the pulp from the first bicuspid, which had in it a filling. The dentist differed with me as to the treatment, but upon my insisting, said he would take it out. When he went into the canal he found it very offensive. He wrote me a letter afterward acknowledging his mistake. The bone around this tooth and around the molars was entirely destroyed, and it led to the diagnosis that one or more of the pulps were dead, and in some places I could hook the point of an instrument over the bifurcation of the roots. The patient asked me the cause of his trouble and enumerated possible causes as I have done this afternoon. I gave him an opportunity to tell

me that he had syphilis; I never asked him the question—I do not need to ask it. He did not tell me. The next time he came I suggested that it would probably be a good idea for him to have his blood examined, so as to make the diagnosis more positive. He consented to the examination, and this is the result: Hæmoglobin, 85. Red blood cells, where the normal number is 5,000,000 to a given space he had 3,900,000. Instead of 7000 white blood corpuscles, he had 15,000. There was also present rheumatic fibrin and many microcytes, showing that the nervous system was breaking down. The examination also showed 100 syphilitic spores to the field. Why should that patient not have pyorrhea alveolaris of the syphilitic variety? It certainly will be treated as pyorrhea of this variety. He will take to mercury like he does to his breakfast, and it will nourish him. After treating 2000 cases, and having proved it by my practice and by observation, I find that these cases can be treated by this method, and successfully by this method alone.

It is a great pleasure to me to hear from Dr. Boenning, and we probably agree on many points of treatment of this disease. I am sorry he did not hear the first part of my paper. He says that he gets excellent results from the treatment of these diseases in from six to eight weeks. My average time is six weeks. I do not open through the face, but from within; and whether others do it or not, I advocate the operation of opening into the antrum from within the mouth, and I also condemn the extraction of teeth for the purpose of entering the antrum through the sockets. I think, so long as the trend of the secretions from the antrum is in a downward direction, that the latter will never return to its normal condition, and it is necessary to open into it through the roof, so to speak, so that the ciliated epithelium may be of real use in carrying the mucus into the nares, which is the natural outlet.

One other point I would like to speak of; that is, abscess in the early stages of pyorrhea alveolaris. There is none,

unless there be an abscessed tooth or necrosed bone; and the necrosed bone must come from some other cause—it is never present in these two instances; and it is so often confounded with suppurative gingivitis. Most of the cases that are thought to be suppurative gingivitis are among those cases that are improved, as Dr. Boenning tells us, by using saline solutions. Any disinfectant solution is beneficial in these cases, as it tones the soft tissues and helps to re-establish the circulation. We will never cure a case, however, by syringing, unless we put something in there of sufficient escharotic power to destroy the diseased membrane—and that we really do by surgical operation; we create sufficient irritation to destroy it, and until that is done we cannot cure these cases. The doctor did not tell us to remove the foreign substances about the teeth, but I presume he does so, for that which has caused the death of the tissues will reproduce the trouble if left there. It is necessary to remove the pathological conditions in order to secure success.

There are a number of things in the paper which I hope the dentists will take up; the etiology of the disease in the first place. It is my opinion that those who fill children's teeth with gold are responsible for this disease in the young.

Dr. OTTOLENGUI. Why?

Dr. CURTIS. By reason of thermal changes, heat and cold, coming in contact with the poorly ossified tooth-structure, and the inability of the pulp to maintain the attacks made upon it. If nature had intended that gold should come in contact with the body, she would have put in metal teeth instead of enamel teeth. It is just the same as when we leave this room: if we leave off our overcoats we will be chilled and nature will recoil from the attack, and it is the nature of the pulp of the tooth to recoil from the cold and heat attacks, and soon, if it is not immediately congested, there is an osseous deposit formed to protect the pulp. Just as we put on our overcoats to protect us, the pulp protects itself by the secondary deposit of dentin, and this continues until the pulp is

destroyed. Should it, however, survive by reason of good health, it will finally result in pyorrhea alveolaris. One of the worst cases of suppurative gingivitis I ever saw was due to secondary deposits on the molars, and that was owing to the dentist covering these molars with caps. In grinding away to fit the caps, he took away the gingival margin. There is no more necessity of putting caps on these teeth than there is of extracting them. This opens up a new field of thought: the osseous condition producing the gingivitis. The cause of the trouble was the grinding of these teeth and producing irritation, which immediately started a new bone-growth. These teeth were solid from the top of the pulp-chamber to the apex of the roots, and if you could have seen the case you would have thought it one of the worst cases of pyorrhea you ever saw. There were no syphilitic scars in the mouth, no lesions, as the examination proved. Dr. Ottolengui will tell you to fill all children's teeth with gold.

Dr. OTTOLENGUI. No, he won't!

Dr. CURTIS. He told us two years ago to fill children's teeth with gold. I expect lots of work from Dr. Ottolengui's patients whose teeth were filled with gold at that time. If the teeth are filled with gutta-percha they can be saved without the use of gold, and even then I believe it is poor judgment, because that is too harsh a material to come in contact with the delicate substance of the enamel in young persons' teeth. I would like to hear from Dr. Ottolengui on the subject.

Dr. R. OTTOLENGUI, New York. I had no intention of speaking on the subject, as I understood that the subject was closed. Dr. Curtis has misstated my position and the facts. I have never said that all children's teeth should be filled with gold, nor that all teeth filled with gold should be filled entirely and solely with gold. There is, however, absolutely nothing in the argument that there is any histological condition at the age of fourteen or twelve, or even at ten or eight, that inhibits the use of gold any more than at any other time. The teeth which I have stated should always be filled with gold—and stated so often that

it is strange that some cannot understand my position—are the initial cavities in the occlusal surfaces of the first molars, cavities that come to you in which you can just put the point of an instrument, not deep cavities; and patients that I have treated that way will not get into the hands of Dr. Curtis. I venture to say that no child who has been exclusively under my care will ever get into the hands of Dr. Curtis. This subject started in my office when I made the statement that there was nothing in the histological condition of children's teeth to prohibit the filling of them with

gold. I went to Asbury Park, and read a paper on this subject, and never said a word about thermal changes; two or three men got up and advanced this same idea as Dr. Curtis about thermal changes. I afterward read letters from Miller, Black, Leon Williams, Broomell, and others, for I had taken the precaution to get their opinions, and asked them if there was anything in young dentin that inhibited the use of gold any more than at any other time, and all five of them said, No. And that is my answer to Dr. Curtis.*

(To be continued.)

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Regular Monthly Meeting—December 1903.

THE First District Dental Society of the State of New York held its regular monthly meeting Tuesday evening, December 8, 1903, at the Academy of Medicine, 17 West Forty-third street; the president, Dr. Henry D. Hatch, in the chair.

After the transaction of routine business, Dr. Samuel L. Goldsmith, chairman of the Clinic Committee, presented the following report:

REPORT OF CLINIC COMMITTEE.

A clinic was held this afternoon in the library rooms of the Grand Central Palace. The program stated that twenty-three clinicians would participate; eighteen actually took part. There was in addition to the clinic an exhibit of dental goods of nearly all the principal dealers of this vicinity.

At none of the clinics was there anything shown in which the clinician had a commercial interest.

The clinics, alphabetically arranged, were as follows:

1. Dr. FREDERICK W. ALLEN, Phila-

delphia, Pa.: "The Bing Tooth as a Support for Teeth Loosened by Pyorrhea or Other Causes." The Bing tooth is a porcelain tooth which has two platinum pins projecting from both approximal surfaces, and these are anchored in cavities of the adjoining teeth with amalgam.

2. Dr. WILBER M. DAILEY, New York city, N. Y., demonstrated his method of packing non-cohesive gold.

3. Dr. L. E. CUSTER, Dayton, Ohio, demonstrated the management of inlay matrices by using a foundation of high-fusing porcelain and finishing with a lower-fusing porcelain, whereby the matrix is not drawn from the wall.

4. Dr. SAMUEL DOSKOW, Philadelphia, Pa.: "A Demonstration of the Micropolariscope, Showing Some of Dr. Edward C. Kirk's Slides." Dr. Doskow

*Dr. Ottolengui's paper, read before the New Jersey Society, on the subject of filling children's teeth with gold, was certainly so illusive that he led most, if not all, who heard it to believe that this was his universal practice.—G. L. CURTIS.

gave also a demonstration of the methods used in making these slides, and at the evening meeting explained more in detail the work he is doing.

5. Dr. WM. B. DILLS, Brooklyn, N. Y.: "A Demonstration of the Practical Use of the X Ray in Dentistry."

6. Dr. H. CLAY FERRIS, Brooklyn, N. Y., gave a demonstration of his seamless crown system, in which he has endeavored to overcome the uncertainty of fit at the cervical margin—a defect often encountered in other systems—the object being to make the mechanical process so complete that any boy in the laboratory should be able to produce a perfect-fitting crown.

7. Dr. F. L. FOSSUME, New York city, N. Y., demonstrated the use of the saddleback and countersunk teeth in bridge work, stationary or removable. Mode of procedure: When a model is obtained with the attachments of the bridge in position, grind and occlude the teeth, and allow room between the alveolus and teeth for the gold, which must be thick enough for support in mastication; now remove the teeth and cut a gold disk a little more than a sixteenth of an inch longer than the under surface of the tooth; anneal and punch holes for the pins, slip into position and burnish to fit; cut four slits in the rim extending outside of the tooth and bend the rim up over the tooth; remove, and solder the four joints. This is best done by investing with the lower surface up and the outer part of the rim exposed. The cap can at this time be strengthened by flowing solder over it. With countersunk teeth the gold will have to be split in the center as well, so as to burnish it into the hollow under the tooth; before removing, put a little wax into the hollow in the gold so as to keep the plaster from running through. When soldered, the caps will fit the under surface of the tooth perfectly, provided the gold was burnished well into place.

The teeth with caps are now put on the model and waxed into place. Attach the wax to the gold only, as the teeth are to be taken out before the bridge is in-

vested and soldered. When this is done, place strips of clasp metal under the caps and flow the solder thick so as to make a smooth surface. This will make the bridge strong enough to withstand the stress of mastication.

If the holes for the pins of the saddle-back tooth are covered with the solder, cut them out with a bur from the inside, where they will be half way through. When the bridge is finished and polished, set the teeth into it with gutta-percha or cement. Gutta-percha is preferable, as the teeth can be easily removed or replaced when necessary.

8. Dr. F. A. GREENE, Geneva, N. Y.: "Attaching Porcelain Facings in Crown and Bridge Work without Heating the Porcelain." An ordinary cross pin tooth is used, around the pins of which is made a box of platinum and the tooth or teeth waxed in position. The porcelain tooth is then removed and the box incorporated in the bridge. When the bridge is finished the pins are bent to a retentive shape and the teeth attached to the bridge with cement.

9. Dr. CLARENCE J. GRIEVES, Baltimore, Md.: "The Construction of Bridge Dummies Saddled for Cleanliness." The doctor claims that cleanliness is obtained only by absolute contact (minus pressure) of the dummies with the bridge by a saddle, this saddle being for contact, not support. Such saddle dummies should be so fully contoured as to leave a saddle only as wide cervically as the necks of the teeth the dummies replace. It is the clinician's opinion that any method expediting the building of such work will lead to the more general adoption of the contact saddle principle, to the infinite betterment of bridge work generally.

10. Dr. CHAS. S. HARDY, Summit, N. J., demonstrated the staining of artificial teeth with porcelain enamel.

11. Dr. E. I. KEFFER, Philadelphia, Pa., gave a practical demonstration of the condensation of gold with the electric mallet.

12. Dr. FRANK W. LOW, Buffalo,

N. Y. Dr. Low, acting in the capacity of model patient, took the operating chair and submitted to the operation of cleaning teeth. Those who were sufficiently interested were permitted, under the doctor's instructions, to use in his mouth for the purpose a new portepolisher handle devised by Dr. H. B. Harrell of Gainesville, Texas. Dr. Low also demonstrated the amount of time unnecessarily consumed where operators are in the habit of shaping the orange-wood points, and advocated that these should be purchased "ready made" at the dental depots. He also exhibited a pair of modified foil-carriers, about which he wraps bibulous paper for the purpose of applying phénol sodique about the necks of the teeth.

13. Dr. L. A. O'BRIEN, New York city, N. Y., demonstrated his method of making a porcelain shell crown for a tooth with a vital pulp, and showed how he had replaced a gold bridge with one made more sightly with the use of porcelain enamel. The doctor also showed a porcelain inlay in a bicuspid where the gum had badly receded. The upper half of the inlay was made of porcelain enamel of the natural gum color.

14. Dr. JAMES E. POWER, Providence, R. I.: "Treatment of Fractured Jaws, and a Demonstration of his Method of Diagnosis." He showed the impression materials used, the making, breaking and reconstruction of the model; the making and adjustment of ten different kinds of splints; also several articulated models with splints adjusted, demonstrating the different splints, and showing those best suited to certain fractures. He demonstrated also the head bandage used by himself, and adjusted on a plaster head—showing a number of kinds and discussing the advantages and disadvantages of each. He spoke principally on the aluminum splint—how it is made, showing dies, etc., and enumerated the advantages of this splint over all others—among which are cleanliness, the ease and rapidity with which it may be constructed and adjusted, and the freedom of motion given to the injured jaw. It

is cemented on to the teeth, thereby holding fragments in correct apposition, but at the same time permitting the patient to masticate ordinary food.

15. Dr. EDWARD B. SPALDING, Detroit, Mich.: "Replacing the Entire Natural Enamel with Porcelain." This, as the name implies, is the substituting of porcelain for the enamel of a tooth when there is deficient enamel from any cause whatever. The process consists of removing all the remaining enamel only to the gum line or slightly below, there leaving a shoulder, and dressing the dentin to a slight cone shape. To this cone and shoulder is adapted a matrix of inlay platinum 1/1000 of an inch, upon which is baked porcelain to approximate the original shape, size, and shade of the natural tooth, after which the platinum is removed, as in the case of an inlay, and the porcelain is cemented to the tooth, which it fits accurately, making a perfectly flush joint with the shoulder at the gum line.

There are two ways of building up the porcelain on the matrix, one the building up and carving entirely with the porcelain body; the other by using a facing made from a vulcanite tooth by grinding out until a very thin veneer is obtained, and then baking this to the matrix with body which supplies the balance of the coating. The former method, that of using the body entire, is used on bicuspids and molars, but the facing is used on incisors and canines.

16. Dr. R. M. SANGER, East Orange, N. J., demonstrated the use of diatoric teeth in bridge work.

Using a bicuspid diatoric tooth for purposes of illustration the procedure is as follows: The teeth are carefully selected to fit the case with no more grinding than necessary. The form in which they are made, with a long curve on the inner surface, permits the cervicolingual surface to fit the curve of the average ridge with little or no grinding, but if any grinding be necessary it should be done on the base of the tooth rather than on the morsal surface. A piece of pure gold plate about 32 gage

is cut to a size sufficient to cover the base of the tooth, and project over the sides about one-eighth of an inch. This is laid on the base of the tooth and burnished to fit as nearly as possible, the edges being turned up all around to form a cup-like shape. A metal ring, which will fit in a crown swager, is filled with hot modeling composition, the morsal surface of the diatoric tooth pressed into it to a sufficient depth to hold it firmly, and the whole plunged into cold water to harden the composition. With the piece of gold in position on the imbedded tooth, it is placed in the swager and covered with corn meal or some equally yielding substance, and swaged down until the gold cup fits the tooth accurately. Upon removal, the gold is trimmed to the desired height around the edges, always allowing it to extend well up to the little holes on the approximal sides of the tooth, and then with a ball burnisher it is burnished into the central depression in the base of the tooth. The gold will be perforated when burnishing it into this hole, but the burnishing should be continued until the metal accurately fits the margins. It is then filled about one-third full with gold or platinum foil. The gold cup is then removed from the tooth, and the balance of the hole is filled with 20-k. solder until it is flush. This gives one a gold cup and pin which closely fit the diatoric tooth, holding it so firmly that it would almost keep its place without cementing.

With the teeth in the cups, but not fastened, they are assembled on the cast and waxed to each other and to the piers on the lingual side. The assembled piece is then carefully placed in the mouth and any error in the occlusion is corrected by allowing the patient to bite the teeth to place. The diatoric teeth are then removed from the cups, and the piers and cups are taken from the mouth in an impression of "terra plastica" or some suitable investing material. This gives you the pieces invested and ready to solder at the approximal surfaces. For additional strength a piece of gold plate is laid across the lingual aspect from

pier to pier, and the whole overflowed with solder. The polishing should be done with the porcelain teeth in position to prevent possible injury to the fine edges of the gold cups, but they should not be fastened permanently in the cups until everything is completed and ready for the mouth, thus avoiding dirty joints. The teeth may be permanently fastened in the cups with zinc oxyphosphate, gutta-percha, or by the use of powdered sulfur, after the manner of attaching English tube teeth to gold plates.

In case of the fracture of one of these dummies, the repair can be quickly and easily done in the mouth, as the diatoric teeth are readily duplicated, but the danger of fracture is very remote, as the porcelain is at no time subjected to heat, and you have the full thickness of the tooth incased in gold to withstand the force of mastication. This method gives you a maximum degree of strength, a minimum display of gold, and an occlusion which is well-nigh perfect.

17. Dr. ROLOF B. STANLEY, New York city, N. Y., exhibited a number of interesting cases of orthodontia, showing numerous models of various stages of his treatment. Inasmuch as it is impossible to show photographs here a description will not be attempted.

18. Dr. M. I. SCHAMBERG, Philadelphia, Pa., performed two operations in which he removed the apices of teeth for the cure of chronic abscess. Radiographs were shown which had been taken before operation, and the doctor explained how these had materially aided him in the diagnosis, and also how they helped him in showing the extent of the operation necessary.

The President then introduced Dr. ROBERT T. MORRIS of New York city, who addressed the audience on the subject of "Infections of the Lymph-Glands of the Mouth and Throat." (See page 449 of the present issue of the DENTAL COSMOS.)

Discussion.

Dr. B. HOLLY SMITH, Baltimore. This extremely interesting lecture, on a

subject which must be of vital importance to all of us, gave me a great deal to think about, and a great deal of instruction which I know will be helpful to me; but it finds me in a very embarrassing situation when it comes to opening the discussion. I have not had the large hospital experience out of which this matter has grown, and with a very limited opportunity for surgical practice in a private office, I think I could hardly pass judgment on a description of the conditions which have been so graphically portrayed to us by this gentleman who has had such large experience.

Dental infection must always be regarded, at least from the standpoint of dental practice, as something to be avoided by our prophylactic efforts. That infected patients do present in our private practice we cannot deny. In my own practice I have had a number of instances of infection, and especially have I noticed a large percentage of hospital internes and nurses, and those engaged in bacteriological work.

I have perhaps not sufficiently definite knowledge as to the best and most accurate plan of diagnosis to determine, without possibility of doubt, the difference between the swelling and infiltration which sometimes arises from a pericemental inflammation, and the infection of these nodes and glands; but it has seemed to me sometimes that there might have been possibly a mistake, when the treatment of an ordinary alveolar abscess, which has seemed to us such a simple thing—simple through a radical procedure, the removal of the tooth—goes on to the removal of a large portion of the alveolus and other structure. I have had a fear that possibly there was no excuse for such extensive operation. When we consider the changes that are to take place in the glands where the leucocytes, the enemies of bacteria, are multiplying, and that the treatment is not directed so much to the focus of this point as to the point of initial lesion, it should emphasize to us dentists the importance of keeping the gingival structures well up on the necks of the teeth. Not so long ago, I attended a demonstra-

tion at which some of the gentlemen here were also present, and we saw forty of the prettiest, cleanest mouths it has ever been my fortune to see. Forty patients were picked out of an ordinary practice; their mouths had received radical treatment at first, all of the infectious material being removed and the teeth polished highly until they had a luster that was grand to behold. They were repolished, then, every month, some of them for six or eight years and others for a shorter period of time. That was one of the most instructive lessons it has been my privilege to have in the later years of my practice. I thought I was doing this very work myself, but I went back home to say that every one of my patients must come under some such treatment, because I think it is the best service I can render them.

I do not suppose there will come a time when we shall have such a wide field of infection of the lymph-nodes as we heard of in this lecture. I hope the time will never come, and I think the best thing we can do is to keep the mouths under our care absolutely clean and sweet. If we do this, certainly we have discharged a large part of our duty to the human race.

Dr. M. I. SCHAMBERG, Philadelphia. I am glad to find myself thoroughly in accord with many of the statements made by the essayist, especially those which refer to infections of the submaxillary and cervical glands resulting from septic conditions within the mouth. Many of us have seen cases of threatened Ludwig's angina which have originated in pus pockets that are formed about third molars. The lower third molar is frequently crowded in its position between the second molar and the ramus of the jaw, and its complete eruption thus rendered impossible. The partial eruption of that tooth causes the gum to form about it in a manner to invite the lodgment of food and other oral débris, in consequence of which more or less severe infections of that region follow. I have recently had occasion to treat several cases of this character, one of which was accompanied by pronounced edema of

the glottis which for a while threatened the life of the patient.

These acute infections frequently become so extensive and are of such a serious nature that prompt action is invariably indicated. I must, therefore, necessarily take exception to that portion of the essayist's remarks in which he advocates awaiting developments. I believe that immediate operative measures are indicated in all cases. We can do no better than to get at the cause of the trouble as soon as possible, remove it, and endeavor to change, by appropriate measures, the septic environment of the part into one free from pyogenic organisms.

A very interesting case which a short time ago came under my care was one in which the patient was suffering from an enlarged cervical gland resulting from a throat infection. The growth was located immediately beneath the ear, followed the line of the anterior border of the sterno-cleido-mastoid muscle, and when first seen by me had attained the size of a hen's egg. It did not respond to the internal administration of iodids, or the topical applications of ichthyl ointment and counter-irritation. I therefore employed the X rays therapeutically, and after eight six-minute treatments during a period of three weeks, the growth disappeared entirely and the need for surgical intervention with its resultant disfiguring scar was thus averted.

Another case which relates somewhat to the subject was a patient who came to me for the treatment of a fistula upon the gum in the region of the lower second molar. I found that tooth abscessed, and upon inquiry learned that suppuration had been active in that region for three years or more, during which time the patient was suffering from frequent outbreaks of boils in all parts of the body. He was treated for general furunculosis in this country without relief, and then went abroad. Neither in America nor Europe did the physicians handling his case associate the condition in the mouth with the constitutional infection. I decided to waste no time in ridding his mouth of the

offending tooth. Its removal was followed by prompt healing of the abscess, since which time the patient has had but one small boil.

The correlation of diarrhea and other gastro-intestinal disturbances with suppurative conditions within the mouth is a subject much neglected. I am sorry that the essayist did not speak of the influence of oral sepsis upon the general health. A physician recently sent me a patient who was in miserable health from a general septic condition brought about by the ingestion of pus consequent upon a marked pyorrhea alveolaris. Upon examination of the patient's mouth I was not surprised that medicines were of so little avail, for he must have swallowed a teaspoonful or more of pus each day. His periodontal trouble being of local origin, and not the result of gouty or rheumatic diathesis, responded in a short time to the thorough removal of deposits from the teeth, together with the institution of local antisepsis. The disappearance of pus from his mouth was followed by a rapid improvement in his general health.

The point brought out by the essayist in his paper, referring to the inadvisability of removing teeth the seat of acute inflammatory or suppurative processes, I must take exception to. I hope the impression will not become more prevalent than it already is, that a patient's life is in danger if a tooth be removed during the height of an acute alveolar abscess, for I believe there is no better treatment than to remove the cause as soon as it is located. In some of these cases the removal of the tooth is unnecessary, but where we have reason to believe that the tooth is doomed, the sooner it is removed the quicker will the part be restored to the normal. The reason why aggravation of the condition so frequently follows extraction is that the socket is neglected in nine cases out of ten. A blood-clot is permitted to form there before suppuration has ceased, and the clot acts as a plug which prevents the escape of pus and causes an extension of the disease. In some cases the patients suffer from a suppurative osteomyelitis,

which gives rise to high temperature. Such cases occasionally terminate fatally through septic absorption, embolism, or other equally dangerous sequelæ. These complications may be forestalled by the packing of the socket subsequent to the curettement of the abscessed cavity.

Only last week a patient entered my office with a very acute inflammatory condition of the face. He said that he went to bed feeling perfectly well, and the next morning woke up with his face so swollen that his left eye was closed. I examined his mouth, and found all the teeth on that side of the jaw equally tender; I was at a loss to know which one was causing the trouble. There was no localized area of fluctuation; there was, however, considerable edema of the side of the face. I took an X-ray photograph of the teeth on that side, and immediately detected an incipient abscess on the upper second bicuspid tooth. I incised and drained the abscess, and had the patient use externally cold applications to his face. This treatment was followed by an almost miraculous subsidence of his trouble.

Never do I advise the use of hot applications to the external face; they only tend to encourage pus formation, and are likely to cause abscesses to point upon the face and produce ugly scars. The intermittent application of cold stimulates the vascular system of the part, relieves the congestion, and brings about resolution, providing it be not too vigorously applied.

The operation of root-amputation I believe to be the best thing for chronic abscesses. Many people are going about with fistulas which have no right to exist in any mouth. The discharge of pus into the mouth is bound to affect the general health. Laymen look upon what are commonly called gumboils as insignificant affairs, not realizing the amount of harm that comes from the constant ingestion of pus. By all means such conditions should be cured, though it entail the extraction of the offending teeth. I should much prefer to sacrifice a tooth than to sacrifice the health of a patient. However, in many instances the abscess

can be cured and the tooth saved by resorting to the surgical method that I described for reaching the diseased area, by drilling through the gum and alveolus.

Dr. H. W. GILLET. I have listened with the greatest interest to what has been said tonight, and I think it has been instructive to many of us. It is a fact to be remembered that a large majority of us do not see these cases at all. When our patients have swollen glands, or a swelling anywhere, that they fail to connect with the root of the tooth, they promptly telephone that they are not feeling well and cannot come—even though they may have an appointment with us—and we do not see those cases. The importance of the suggestion which is made concerning the possibility of septic pneumonia is very great. It is a new thought to me, and one which requires careful consideration whenever we have such cases to deal with; but one of the points I wish to suggest in this connection is the importance of sterilization of the field of operation in such work. It is my impression that in the vast majority of cases where teeth are extracted, very little attention has been paid to sterilization of the mouth. The very marked difference in the oral condition, in cases of extraction of foul roots, between cases where sterilization of the mouth is performed and where it is not, will immediately challenge your attention when you carry out the idea. I feel that in a city like New York, where most of the extracting that becomes necessary in the practice of members of an association like this is performed by specialists, we should have a little more investigation of what goes on in those offices. I have sent cases to such specialists and have been very much dissatisfied with results just along that line. I have sometimes hinted that some further precautions might be taken, but have not found a specialist who has been interested in that point of view.

The point which was made by the last speaker, concerning the possibilities of auto-intoxication or auto-inoculation, by reason of the pus formation in the mouth, is also important. It is some-

thing which is too often neglected in our own practice. We are sometimes too eager to keep in the mouth teeth which cannot be other than sources of infection.

Dr. JAMES E. POWER, Providence, R. I. I cannot recall any cases in my practice where the results have been as favorable as they have been with the essayist; but I can report one case where these lines were followed by a physician, and where part of the upper jaw had to be removed as a result.

A little child five years old had been troubled by an abscess in a deciduous tooth. He was taken to a dentist for advice. The dentist gave instructions to keep the tooth in position until the swelling subsided and then have it extracted. After a few weeks the child's mother took the little one to a physician, who examined him and said that treatment was all right, but that she should put on a hot flaxseed poultice. She did so, and after a week had passed the pus burrowed through the antrum and broke through the tissues under the eye, making an external opening large enough for me to insert my second finger.

Three months later he was brought to me for advice. I advised an operation, which consisted in removing the jaw, from the canine tooth back to the condyle on one side. During the treatment of the child I saw him every morning, dressed the wound, etc. During this period, and at different times, twelve ounces of pus were taken from the child's head, not counting that which drained out between dressings. I discharged the child, cured, seven weeks after the operation, and showed a photograph of him at my clinic this afternoon.

This case I think shows the advisability, in some instances at least, of removing the tooth. I feel that in all surgical work one must remove the cause in order to perfect a cure. In this case, as in similar cases, the tooth was the cause of the trouble.

I agree heartily with the essayist in not using pressure when treating abscesses after the incision is made. I

learned this from a general surgeon at home. He developed an abscess, and after I made my incision he would not allow me to use any pressure to expel the pus, saying that the pain was too great, and that it was unnecessary. I observed this case very closely, and the result convinced me that pressure not only caused great pain, but did not cause a quicker cure.

Dr. F. W. Low, Buffalo. The difference of opinion as to the immediate extraction of the tooth may possibly come from the fact that we see a different class of patients from that which the essayist sees in a public clinic. Most of our patients in private practice are tolerably well-nourished people. A great many who attend the public clinics are very much below par, and that would make a decided difference.

At the last meeting of the City Dental Association, in Buffalo, one of our members made the statement that the first thing he did to his patients was to sterilize their mouths *thoroughly*. I asked him if he baked them or boiled them, and I feel tempted to ask Dr. Gillett and Dr. Rhein the same question.

I believe if we could aspirate some of these pus conditions—to try the needle instead of the lancet—perhaps we would find that the general surgeon had taught the dental surgeon something. I am going to try it, at least once, anyhow.

Dr. E. A. BOGUE. I was much pleased to hear the essay this evening, and as usual regret the absence of something which I had hoped to hear. The subject as printed in the program is "The Infections of the Lymph-Glands of the Mouth and Throat," which has scarcely been touched upon in the discussion. During Dr. Morris' lecture I heard a good deal that was enlightening, but there was a great deal more that I wanted to hear and did not.

For example, he tells us about the staphylococci. He warns us against meddlesome operations and improper treatment, but he does not mention anything more than the fact that the streptococci may be present. He tells us nothing about the anti-streptococci serum

which may be used on occasion, and which I am afraid is not used very often. He could tell you, as he has told me, that he regards the abscesses of lower third molars, which sometimes bring the condition mentioned in the heading of the paper, as the most fatal of all the diseases of minor surgery.

I was hoping that while he was upon the subject the essayist would bear in mind the fact that we who are his students and listeners are seldom called to see these cases, but when we do see them we want to know what to do under the circumstances. We want to know how to diagnose the different conditions, and what steps to take for the safety of the patient.

I hope Dr. Morris will enlighten us as to the use of the anti-streptococci serum, and as to the steps to be pursued when we find a patient in our practice who has been so neglected that he reaches the point of infection. I have seen but few, perhaps not more than half a dozen, in New York city. I think I saw more in my residence in Chicago than I have seen here; nevertheless we do see them occasionally. And when impacted third molars, and the frequently needless extraction of them, bring about a condition of things that may be properly described as infections of the lymph-glands of the mouth and throat, we would like to know, from those having many times the experience that all of us put together can have, just what course to pursue.

Another thing: A little dread has been experienced on the part of some of us about putting patients into the hands of the general surgeon. I must say I share that dread, because sometimes a slight operation at our hands becomes a serious one in the hands of the general surgeon.

Dr. CHAS. G. PEASE. I would like to speak to that part of the paper presented by the essayist which relates to the treatment. The essayist says, "Do not focus the attention upon the part, but look to the general health, and send the patient out to play golf and other outdoor sports." In line with this thought I will report the case of a lady of about fifty

years of age. A diagnosis had been made of septic condition of the parts about the inferior maxilla, the result of a septic abscess about the first molar, which had been lately extracted. The tissues inferior to the maxilla were hard and indurated, and so greatly swollen that the patient could not close her dress at the throat. A general surgeon had said that an operation should be performed to save her life—that the tissues should be stripped from the bone on both sides and underneath, and the bone scraped. The husband would not consent to the operation, claiming that his wife had heart disease and so could not take an anesthetic. In consulting with me he asked what could be done. I said that the only alternative would be mental therapeutics, and the case was placed in my hands for that treatment.

The mind was not focused upon the part, but upon the spiritual perfectness of man, lifting the patient from depression into joy. Her susceptibility was so great that at each visit she exclaimed repeatedly, "Oh, what joy!" and I always left her in an uplifted condition. The induration and swelling decreased markedly at each visit. The parts were cleansed with a wash of dilute electrozone to keep them sweet. With the exception of a relapse on one day the case went on to a speedy healing, causing expressions of marvel on the part of the patient, husband, and daughter. Not only was there healing locally, but the general health was restored.

Dr. LEO GREEN. There was one statement of the essayist's upon which I would like to have some information. He finds the contents of the pus sacs sterile. We frequently meet with cases of empyema of the antrum, supposed to be due to infection from pus discharging into the antrum. If the pus be sterile, why does an abscess of the molar tooth frequently cause empyema of the antrum? Furthermore, we notice that surgeons are particularly cautious against infections from discharging abscesses, whether they be in the appendix or other parts of the body; and we frequently hear of this or that surgeon losing his

life as a result of infection in evacuating abscesses in different parts of the body. Our experience in examining slides of the various cocci is rather limited, and I should like to have Dr. Morris elaborate on that point.*

Dr. M. L. RHEIN. I do not know of any more interesting subject that could be brought to our attention at this time than the one presented tonight. In listening to the discussion, as far as it has proceeded, I have been forcibly impressed by the lack of sympathy with the views of the essayist upon the vital question presented by him. I must say that I thoroughly share this feeling. The trouble between the general surgeon and the so-called dentist is that neither of them understands the other. The general surgeon has never had a proper primary education in regard to the real anatomy of the mouth and its surrounding parts. Whatever education he has in this particular is one he acquires for himself later on, and—as all educations of that kind are—is frequently defective.

The last speaker in discussing this subject brought out a point that covers this very extensively, and it is one of the points that was not alluded to by the essayist, although one of the most common ones—that is, where the infection proceeds directly through the antrum and through the other countless means of exit that it has from that region. The anatomical difference in different human jaws, both in the upper and as far as the inferior maxillary canal in the lower, is so varied in different people that it is impossible, unless a person has devoted a great deal of attention to this special study, to feel at all positive of the exact anatomy of the various sinuses and canals in handling such cases. This is an important point for the essayist to consider in regard to his suggestion as to the means of diagnosis when we get infections of the mouth or throat, and one that must be largely taken into ac-

count in making a diagnosis. There is no reason why a diagnosis of these conditions should be made upon any different line than diagnoses are made in general, and that is, by exclusion. It is the only reliable line we have to go by.

The main point of contention between the essayist and those who have discussed the subject has been manifested by the exceptions that have been taken to what he has described as the passive form of treatment when infection has taken place. When the infection is in an active exciting condition, the essayist advises, as we understand from the discussion, that no operative interference should take place, because the leucocytes are capable in themselves of combating and destroying whatever bacterial influences are at work. This is very true as long as the leucocytes succeed in overcoming them and gaining the victory, but the essayist has not alluded to what would happen if this were not so—and very often it is not so, due to lack of sufficient vitality, exactly in the class of cases that the essayist speaks of—the underfed, the poorer class of our population. When the vitality is not up to par the leucocytes are not always able to gain the victory, and we are sometimes confronted by a post-mortem instead of a recovery.

I do not believe that Professor Morris would take the floor and say that in a case of acute appendicitis he would wait until the leucocytes had defeated the bacteria and rendered the pus sterile before operative interference should be undertaken. A principle in surgery, if it be true in one part of the body is true throughout the entire organism. There is one point that must not be overlooked in what Professor Morris has said to us, and that is that there is a certain class of infection in the mouth that has no distinct cause such as we dentists are accustomed to look for. It is this infection, due to the absorption of toxic matter frequently—auto-intoxication—that has proceeded through the lymphatic region but has not shown itself in any of the so-called dental regions. In such cases, therapeutic treatment will frequently suffice; in fact operative treat-

* Dr. Robt. T. Morris afterward admitted to me that the term cyst, instead of abscess, would have been better. Of course the contents of cysts are sterile, while abscesses are not.—L. G.

ment, when these cases are accurately diagnosed, is not called for. These, however, are not the cases that we as dentists are considering. When we have brought to our attention, whether in a dispensary or in our private practice—the difference matters little—a case of infection of the lymphatic glands due to some distinctly exciting focus, the surgical principle remains the same—that the sooner the exciting focus is removed and the wound properly attended to, the less the vitality of that patient is going to be impaired, and the better chance he will have for a proper recovery. The infiltration and absorption of purulent matter, notwithstanding operative interference in some cases, is due to the condition of the patient being so enervated that the natural vitality is wanting, and the death of such a person is almost an assured fact from the outset, whatever the course of treatment may be. If such a condition exists, the only possible chance for the recovery of the patient lies in *proper* operative treatment.

A practical point in the discussion that has been brought out, and one that I am sorry the essayist has not touched upon in some of his criticisms of so-called dental treatment, is, How shall these wounds be taken care of, so that infection shall not proceed? I sympathize thoroughly with the remarks made by Dr. Gillett and some of the other gentlemen as to the necessity of careful sterilization of the mouth prior to surgical operations of any kind. That same sterilization should be kept up afterward; but is it done by the general surgeon when he operates on the mouth? I have found in the course of considerable inquiry but one surgeon in this country who satisfactorily answered that question.

In operations on the parts below the mouth, for example in an appendicitis operation, where the drainage through the digestive tract is bound to reach the very point of operation, does the surgeon ever take the proper methods to sterilize the mouth of that patient, prior to an operation? I have never seen them do it, and I would like to call that to the attention of Prof. Morris this evening.

A great many of the fatal cases have resulted from the extraction of teeth after or while acute infection has been in course of progress; but I have never seen a well-authenticated case of that kind, where the wound was taken care of in the way a surgeon would take care of a wound ordinarily.

I agree thoroughly with the essayist in his stricture upon the method of procedure in the extraction of teeth. The extraction of teeth is looked upon as a very ordinary and simple operation, and many think that when it is accomplished the patient can be dismissed with impunity. If the health of the patient is good, and there is no focus of infection left in the wound, it is all right; but if there is, we have all the evil results Dr. Morris has pointed out, and it brings home the lesson to us that Dr. Gillett has spoken of, that if we as dentists are willing to send our patients to have their teeth extracted by men who call themselves specialists in this line of work we are responsible to a degree, and it is our duty to take care of that wound in a proper surgical way after the tooth has been extracted. If we do this we shall not have any such results as have been portrayed to us.

Dr. A. R. STARR. We do see cases of inflammation of the glands, with swelling, but we very seldom find in private practice that the inflammation or infiltration of these glands goes on to the formation of abscesses requiring operation.

I do not know that I can recall having seen a case of that kind in private practice. The inflammation of these glands is usually so slight that nature takes care of it. If any pus forms, the lymphatics may usually be sufficiently stimulated by the treatment with counter-irritants, hot fomentations, etc., to carry off the products of inflammation, and it is very rare for the dental surgeon to be called upon to operate on these glands. I should think the treatment suggested by the essayist would be very good—that is, not opening up very extensively, but using the aspirator and the needle. I have seen some instances where the gen-

eral operator did not treat such cases as a dental practitioner would. I recently saw a case where a surgeon removed what was supposed to be a cystic tumor below the mandible. The wound would not close, and it was operated on again for the removal of the cyst. Upon dressing it subsequently, I found that the cyst communicated with an abscess on the root of a lower molar. Pus was exuding from the cyst at the time I saw it. Upon proper treatment of the abscess, the cyst and the pus disappeared.

Dr. MORRIS. If there had been a general agreement with the lines I brought out, I would not have learned so many good points, and the audience would have been asleep. That has only occurred to me once. Not long ago, they wanted a photograph of my class at the college. The man who came with the flashlight apparatus forgot to give us instructions about winking, and he chose a moment when I was lecturing and gesticulating. When the negative was developed, every man was fast asleep!

Dr. Smith speaks of the importance of keeping the mouths of his patients aseptic and clean. It is very nice if you can get your patients to do it, but the difficulty is in getting very busy men to attend as closely to their mouths as they do to their bank accounts. It is a more difficult matter to arouse their interest in one than it is in the other. Sometimes the dentist is interested in both.

Dr. Schamberg spoke of the X ray in relation to infections of the glands of the mouth and throat, and I shall have a good mass of statistics upon this subject in the course of another year. I have introduced in my clinic an X-ray outfit, and have detailed two assistants to attend to it. I turn over to them two or three patients a day. We have had a lot of failures and a lot of interesting successes. At the end of the year we shall have a lot of facts. The question of gouty tendency being caused by pyorrhea—or pyorrhea caused by gouty tendency—is a question in which we can never tell which is cart and which is horse until we have made the analysis in the individual case. I know of patients

suffering from so-called lithemia because of general systemic infection from pyorrhea, and if their teeth were cleaned up they would get rid of their trouble. I know on the other hand of gouty patients, lithemic by inheritance, who were apt to have insoluble precipitates about the necks of the teeth. Those insoluble precipitates are apt to separate the gingival membrane, and give rise to pyorrhea. At least that is what I think.

Dr. Schamberg brought up a point which was agreed with by many, that the moment for removing an abscessed tooth is during the moment of greatest infection. That is a point the dentist must determine by experience; I can only discuss principles. As a general principle, the greatest danger of doing work is at a time when bacteria are rapidly proliferating. The exceptions must be worked out by the specialist. The examples of danger I have in mind, and which led me to speak on that point tonight, are examples that walk into my clinic—if they are able to walk—with such infections. What the proportion is I do not know, because I see these cases collectively. I have seen two or three cases of infection resulting from removals of abscessed teeth in an acute stage, in the course of a week. They may make only a small proportion—so small that you dentists might say, “We shall do all this work at this time, and let those few patients die, because we shall save more.” That is a principle that is all right providing we are acting on sufficiently good data, well collected—let the few die for the sake of saving the greater number—if we are certain of our facts.

Dr. Low says that many of the public clinic cases are below par; but we get not only those below par, but many who have neglected to follow out the instructions you have given them. The responsibility rests with the patients, because they are not in the habit of assuming their proper share of the responsibility. I see these cases at the clinic—patients who do not know the meaning of the word “responsibility” on their part, or on the part of the dentist. That is why cases of this sort deeply impress me.

Dr. Bogue asks about the use of anti-streptococci serum. That is a means that is being experimented with at the present time—at first with a good deal of failure. We do not quite grasp the situation; more experimenting has to be done, and along that line of investigation I expect to see eventually excellent results, but the work includes more features than we had anticipated, and while progress is being made, and the anti-streptococci serum does what we expect it to do in some cases, there are many failures. I think the intravenous saline solution will do more on the whole than the anti-streptococci serum will do. The saline solution acts at once. Toxins are eliminated, leucocytosis is increased, and cell-resistance is increased, and often—even when the patient is dying with septicemia—in an hour or so there is a changed condition for the better. That matter of blood-washing—washing out the poisons that are affecting the ganglia, the nerve-centers, is an important one; but I avoided it this evening, intending to hold principally to the infection of the lymph-glands.

Dr. Bogue knows of a case of pyemia—a popular broker—about a year ago, in which the dentist came pretty near getting into court, and one or two of us, working without the dentist's knowledge, really kept the matter out of court. In that case the dentist did everything right, as I believe. The case went on to pyemia, and the patient died with infection of the lymph-glands of the throat.

Dr. Bogue quoted my saying in conversation that these cases were the most fatal among minor surgery cases. I would say *among* the most fatal, because they are not classified for a scientific statement to that effect. I very likely did say that to Dr. Bogue in discussing the question offhand. Sitting in an easy chair, smoking a cigar, we sometimes say things we do not like to see printed afterward. I might have said that they were the most fatal; yet here, before an audience, I would prefer to say they are *among* the most fatal.

Dr. Pease brings up a point that has been the subject of a good deal of atten-

tion at Albany and elsewhere—and Dr. Pease is right; I agree with him. The only thing to be sure of is the proper person to administer that treatment, the proper person to receive it, and the proper time. It is all right if you get that combination, but that combination is very rare. There is no doubt that the application of mental therapeutics is enormously valuable. Hope increases digestion, and that in turn increases cell-resistance. The man who is carrying on a successful movement in Wall street today is the man who is eating three good meals a day, eating good dinners and enjoying them—his cheeks are red and his heart is right. You cannot give him scarlet fever, or pneumonia, or anything but dollars. Hope stimulates all of the processes of digestion, and increases cell-resistance in that way. Despondency, on the other hand, lessens cell-resistance. Grief results in loss of appetite; with loss of appetite we have lack of active function of the intimate ganglia of the bowel wall. Such a person's digestive organs do not work well, because they are not carrying on their proper functions; intestinal fermentation occurs, the patient is poisoned by toxins, resistance is lessened, and he may take up any illness. You cannot class together the man who is making a success in Wall street and the person suffering from a great grief. Cell-resistance elevated, cell-resistance depressed, is the great thing we are dealing with, and mental therapeutics is immensely important—if the patient will take the dose.

As to the question of the infection of the antrum, that is rather outside of the real subject, and I had not intended to diverge, because one can readily go off into the antrum any distance. It was really a difficult thing for me, in bringing up this matter, to keep fairly close to the subject.

Dr. Rhein stated a good many truths. The first was that we do not understand each other—the surgeon and the dental practitioner. That is not because we are not willing, but because we have not the time. It is not because there is any animosity in the matter; it is merely a

matter of being too busy. The conclusion is that in our education we must so systematize the teaching of principles that Dr. Rhein and I may know the same things. It is a matter for which educational methods today are responsible—a matter that will be settled by education; but today it is true that we do not understand each other as well as we should on these points and others.

Dr. Rhein spoke of the advocacy of the passive form of treatment. In the infections of the glands, chiefly of the throat and mouth, we are to avoid general infections that might occur by passive treatment, as a principle. Now, just where the exceptions are to occur I am to be told by men who know more about it. The principle of leaving the tissues alone while a warfare is being successfully waged between the bacteria and the leucocytes is a good general principle, and the cases that made me bring that up for discussion tonight are those in which meddling had done damage—and I have seen many such. You may see others in which damage would be done in carrying out that principle; but ultimately our knowledge will be common knowledge, and we will agree.

Dr. Rhein says leucocytes are not always able to gain the victory. Surely not. What are we to do? That is a matter of special knowledge. He brought up the question of appendicitis; that is another point requiring special knowledge; it shows how much we all have to know. In appendicitis I have had a much harder fight in getting surgeons to operate promptly—early, at the outset—than I have had over any question that came up here tonight. It was a bitter fight for years. There the special principle centered upon a little point. In the appendix we have a muscular sheath that cannot stretch readily. In the appendix we have lymphoid tissue that is bound to swell when it is affected. That

tissue that is bound to swell, in a tissue that cannot swell, is the irresistible force meeting the immovable body! In appendicitis the tissue that swells in the sheath that cannot swell results in pressure anemia, and the bacteria eat up the anemic tissues because they are without leucocyte protection. The patient dies, or has complications from appendicitis; therefore cut the field of battle out; but the reason why we do it at that moment, instead of letting the warfare go on, is because we know why we must cut it out. So in dealing with these matters in dentistry; you gentlemen know the special reason why action should be taken at a special time, but the cases that give trouble, that I see at my clinics, are those in which such knowledge was not brought into play.

The method of caring for the infections was such a large one that I really avoided bringing up details for discussion tonight; it would probably have added an hour to my remarks. The matter of mouths not being sterilized in cases of disturbances of the gastro-intestinal tract is one I have thought about intently since Dr. Rhein brought it up. It is something I had overlooked in my surgery, and I realize the importance of it. I am engaged considerably in gastro-intestinal work, and looking out for various infections; and yet I can see that many of my patients might have avoided a lot of intestinal irritation if I had had Dr. Rhein there.*

On motion the society gave a very cordial vote of thanks to the essayist, and also to the clinicians of the afternoon.

Adjournment.

B. C. NASH, *Secretary*.

* On speaking to my nurses at the Hospital on the following day I found that it was part of their special regular duty to keep the mouths of the patients disinfected.—R. T. M.

THE DENTAL COSMOS

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EDITORIAL DEPARTMENT.

THE CONGRESS OUTLOOK.

WE publish in this issue considerable general information as to the present progress of the work of organizing this great meeting. The data given are, however, only general in character, and will serve to indicate roughly the amount of detail work which has already been done. In consideration of the fact that active preparation was begun only about a year ago, the results attained in that relatively brief interval are gratifying.

In the United States, in each state and territory, the work is well organized by the appointment of state committees charged with promoting in a local way the success of the Congress. These committees are charged with the raising of funds by subscription from state and local societies, securing memberships and vouching for their ethical character, securing essayists, clinicians and exhibits, and reporting them to the committees having these special features in charge. The activities of the state committees are already manifest in the results accomplished. Not only are the elements of an attractive program assured, but the financial basis of this great movement is practically now secure, if the contributions already pledged are promptly turned into the treasury.

Those in touch with the general work of organization are the most competent to judge of the results accomplished, and of the outlook for a successful issue to their endeavors. When the appeal was first made to the dentists of America to assist in this enterprise, it was with confidence that the *esprit de corps* and professional patriotism of a body of men who have done so much to create the profession of dentistry could be relied

upon to carry out the plan upon a scale commensurate with its importance. That belief was justified, as has been shown and is being shown by the enthusiastic response in work, in the membership applications, in the contributions of money, and in the expressions of good will which are coming in from every state in this broad Union. St. Louis and the Fourth International Congress are now the watchwords of the dental profession of America.

But this is a national matter only in the sense and for the reason that the dentists of America are engaged in preparing for a dental convocation of all nations and are acting the part of hosts in a great international gathering of colleagues from all parts of the world. It is an occasion to rouse national pride, for it affords an opportunity to our profession to give a practical demonstration of those sentiments of good fellowship and hospitality which they personally realize and which never is found lacking in our country when occasion calls it forth. This is an occasion to call it forth in bountiful measure.

Co-laborers in the field of professional dentistry in foreign lands will be with us in goodly number, many of them for the first time, attracted in a general way by the novel features which America is sure to have in store for them, attracted by the reputation of our people for the hospitable welcoming and entertainment of their guests, but in a special way attracted by the opportunity which this Congress will afford for the study and comprehension of that thing which has been so generally spoken of as "American dentistry." They will come to applaud, if need be, but to criticize as well should occasion call for it, and certainly to make careful comparison of what they find here with that method, that ideal in dentistry in which they have severally been educated in their respective native countries.

If every man be a debtor to his profession, so also is he the custodian of his profession's honor. Each member thereof is responsible in his degree for its standards, its successes, its failures. The opportunity which opens itself to the American dental profession in August next carries with it a corresponding responsibility—one in which each legalized American practitioner shares by virtue of the fact that he is an American dentist—a responsibility to see to it that naught that we have claimed for ourselves as a part of a great profession shall suffer by comparison with that of other nations in any particular. We present this view not because we question the character of the verdict when the records shall have been written, but nevertheless for consideration, to the end that our colleagues may not fall short in their endeavor from any failure to appreciate the nature of the situation before us.

But what of Europe in connection with this Congress? The dentists of Europe are already fully familiar with the importance of international congresses. They have been concerned in the organization of and partici-

pation in two great and successful meetings of this character. They have become imbued with their importance in not only disseminating advanced knowledge of the art and science of dentistry, but our transatlantic brethren appreciate perhaps more fully than we do as yet the very great influence which the social aspect of these gatherings brings to bear upon the betterment of international relations. The dentists of Europe are for these reasons actively and enthusiastically supporting this movement. Twenty European countries have established national committees of publicity and propaganda for promoting the interests of the Congress in all necessary ways. The contributions of European dentists to the program are already numerous and important. These will represent and portray the best in European dentistry, which will be brought into critical comparison with our own work in all lines at the Congress.

In the further discussion of international professional relations, and of the best means for promoting the world-wide solidarity of dentistry, the fact must be faced fairly that various points of view have to be considered and superficially diverse interests harmonized; and here it is most desirable that the American profession make no *faux pas*, and that it be not surpassed by any of our guests in performing the part assigned it. Let each member of the Congress realize his responsibility to his comrades and to professional history, and recognize that if the process of crystallization now at work is to reach its largest and most beautiful result, all jarring and marring elements must be sedulously eliminated. The subordination of national bias is implied by the axiom that "Science is of no country," and the curbing of any tendency to undue assertion of private views that may be strongly held, or personal or special interests that may seem to be receiving too scant recognition, will become less important on calling to mind the self-evident fact that the gains to be secured by organization can be enjoyed only after mutual concession. Let the best endeavor be made to arrive at unanimity as far as possible, and let every member of the great gathering at St. Louis be actuated by loyalty to the highest ideals, at the same time conceding no less exalted motives to his fellows.

The situation is one which has aroused interest throughout the world of dentistry. Let us remember that the responsibility for the outcome does not rest upon any indefinite body of men, but upon each individual member of the dental profession, to work with a will to make the Fourth International Dental Congress a record-breaking success.

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STUDIES IN COMPARATIVE ODONTOLOGY.

By ARTHUR S. UNDERWOOD, M.R.C.S.,
L.D.S. London: Baillière, Tindall &
Cox, 1903.

This work constitutes an interesting and attractive presentation of the subject of comparative odontology, and is replete with information of value and interest to all students of anthropology and paleontology, as—"The fact that the teeth are very imperishable, and retain their form and structure for an indefinite time, notwithstanding geological changes that have destroyed most of the other traces of the animal world of bygone times, coupled with the fact that the lower orders of animals often erupt and shed countless numbers of teeth, has resulted in odontology being the most serviceable key in the possession of modern science for opening the door to the history of animal life in remote ages; sometimes, indeed, the only means we have of unraveling the many problems of paleontology."

The book is divided into sixteen chapters, comprising 145 pages, and therein the author discusses the form, characteristics, and attachment of teeth of the four great classes of the sub-kingdom Vertebrata, together with a study of the skeletons of some extinct many-toothed forms of the class Aves.

We commend the book to every practitioner and student of dentistry, feeling that its perusal cannot fail to throw light on many questions bearing on the work of their specialty.

J. E.

LEHRBUCH UND ATLAS DER ZAHNHEILKUNDE, MIT EINSCHLUSS DER MUNDKRANKHEITEN. By GUSTAVE PREISWERK, M.D., PH.D. Munich: J. F. Lehmann, 1903.

We have already, and on several occasions, expressed our views on the teaching value of condensed works upon dental subjects, and we continue to look upon them as agents of limited availability in the realm of dental education.

In some, but indeed rare cases, they may be made to serve a good and useful purpose—as, for instance, in elucidating certain points rendered apparently obscure and complicated in the larger textbooks by reason of the verbose style of some authors. Beyond this, however, we believe that abridged books are not without harm, being likely to induce, particularly in young and immature minds, the objectionable mental habit of relying upon others for that type and degree of thinking and discrimination so necessary in the study of medical and scientific subjects, especially in their bearing and application to dental or other specialties of the healing art.

Notwithstanding, however, our objections to compendiums, we are pleased to acknowledge that the work under consideration possesses some features, such as clearness of style, and a scope embracing the most important points with which every dentist should be familiar. Beginning with a sketch covering the several historical periods up to the publication of Fauchard's book in 1728, this work embraces a condensed survey of the

anatomy of the mouth and its contained organs, and of the physiology of these regions, together with histology, bacteriology, pathology, therapeutics, operative dentistry, anesthesia, local and general, and extractions.

The illustrations—one hundred and fifty-two half-tones and wood engravings, and forty-four plates—constitute one of the most important features of the work, and add materially to its value and attractiveness.

J. E.

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REVIEW OF CURRENT DENTAL LITERATURE.

[*L'Odontologie*, Paris, March 15, 1904.]

COCAIN-ADRENALIN. By DR. LOUP, PROFESSOR AT THE ÉCOLE DENTAIRE OF PARIS.

The use of adrenalin combined with cocain for hypodermic injections has been recommended for the reason that adrenalin increases the anesthetic power of cocain and diminishes its toxicity. Adrenalin is a powerful hemostatic, an efficient vaso-constrictor, which, instead of depressing the heart as is the case with cocain, increases the force of its contractions.

The addition of adrenalin to cocain solutions results in several advantages—such as limiting the action of the anesthetic to a definite area; an increase in the anesthetic power of the solution; a bloodless operative field. Adrenalin contracts the muscular coat of the bloodvessels and thereby prevents the diffusion beyond a certain area of any drug associated with it. The systemic effects attributed to cocain cannot take place, inasmuch as the diffusion of the agent is prevented. Hemostasis is more powerful with the adrenalin-cocain mixture than with cocain alone, and the hemostatic action is due to the contraction of bloodvessels through the action of adrenalin.

The author claims that cocain in the therapeutic dose of two to three centigrams does not exercise any action whatever on the heart. Some authors believe that the syncope which

is at times observed in the course of operations under cocain anesthesia is due solely to the effect of this agent upon the heart, but Dr. Loup has found that the psychic state of the patient plays a rôle just as important in the production of those systemic phenomena the cause of which has been attributed entirely to cocain.

The author, in collaboration with Dr. Grignon, has collected very interesting data on the effect of the cocain-adrenalin mixture. The same phenomena which at times follow the use of cocain alone have been observed with the cocain-adrenalin mixture. Patients have fainted under the adrenalin anesthetic mixture exactly as happens with the cocain solution alone, and from these observations he concludes that adrenalin does not prevent the depressive effect of cocain upon the heart. It is further stated that this conclusion could be formulated *a priori*, inasmuch as adrenalin as employed in dental operations does not exercise any influence beyond the area of injection or its immediate neighborhood.

The author then takes up the question of post-extraction hemorrhage, this phenomenon having been attributed to the action of adrenalin when used as an ingredient of anesthetic solutions. In order to ascertain whether this is really the case, Dr. Loup made a study of several cases of post-extraction hemorrhage, and he found that adrenalin cannot be considered a factor in their causation.

Some observers have found that the injection of adrenalin into the tissues is followed by the formation of eschars, owing to the presence of free hydrochloric acid in some preparations of the suprarenal gland. Dr. Loup states that in his opinion the hydrochloric acid has nothing whatever to do with the formation of these eschars, and attributes their occurrence to the vaso-constrictive power of the drug. The circulation being arrested, the tissues die through lack of nourishment.

In concluding his communication, the author says that adrenalin should be cautiously employed, not so much on account of its systemic as of its local effects. He recommends that only fresh preparations be used; adrenalin decomposes readily and solutions are then likely to induce serious inflammatory phenomena; these were observed by the author in two cases of extraction.

Dr. Loup considers that the usefulness of adrenalin is very limited, inasmuch as it does not decrease the intensity of the systemic effects of cocaine.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, January 1904.]

CONTRIBUTION TO THE STUDY OF SEPTICEMIA OF BUCCO-DENTAL ORIGIN.

By DR. C. SABATIER.

Systemic infections of dental origin may be classified under three important headings, viz, chronic septicemia, acute septicemia, and pyemia. It was in 1865 that Richet, in a paper read before the Société de Chirurgie, called attention to the occurrence of systemic phenomena following operations in the mouth and fractures of the maxillæ. Magitot, Tillaux, Molliere, Pollosson, and Lejars have mentioned the possibility of serious general intoxications of dental origin, but nowhere has it been possible to find an exhaustive study of this question.

The author discusses the mouth from the point of view of its suitability as a medium for the development and growth of bacteria. He reviews the varieties generally found in the mouth, saprophytic and pathogenic, and the means of defense of the buccal cavity, before taking up in detail the three great varieties of septicemia. He discusses every one of these types of septicemia in a most exhaustive way, giving a classified list of fifty-six cases collected from the literature on the subject, and sums up his valuable paper in the following conclusions: 1. The buccal medium contains normally a certain number of microorganisms, which, while being of the pathogenic variety, seem to live as saprophytes. 2. If from any cause they should regain their

activity they are capable of giving rise to infections of various forms. 3. It has been observed that serious complications follow occasionally lesions of the teeth and suppurations of the gingivo-dental region and stomatitis, owing to a systemic intoxication by varieties of microbes or their toxins. 4. These intoxications, which belong to the type of septicemia, may be of the following varieties: (a) Chronic septicemia, almost always consecutive upon prolonged suppurations of the gingivo-dental region. (b) Acute septicemia which are stages in the course of chronic septicemia or else true acute attacks following surgical interventions or other causes which render the organism more vulnerable. (c) Acute septicemia can be divided into three groups: acute non-localized septicemia, acute lymphatic septicemia, and acute phlebotic septicemia. (d) Finally, in certain cases true pyemia develops, or intermediate forms between septicemia and pyemia. 5. In the majority of cases the prognosis of acute septicemia is fatal. However, there are certain forms which, while of very severe nature, do not terminate fatally, either because of timely rational therapeutic interference or because they develop in strong organisms free from organic lesions or diatheses. 6. The possibility of severe intoxications following supuration of the gingivo-dental region explains the necessity of combating by all the means at our disposal any suppurative process, whatever be its degree of intensity.

[*Cincinnati Lancet-Clinic*, April 9, 1904.]

THE PLUGGING OF BONE CAVITIES WITH IODOFORM. BY DR. MOSETIG-MOORHOF.

The author reports (*Deutsche Zeitschrift für Chirurgie*) the results of 220 pluggings (in 195 patients) of bone-cavities with an iodoform mass. The mass used is a mixture of 60 parts finely powdered iodoform and 40 parts spermaceti and sesame oil. This gives a yellow mass which is stiff at room temperature and melts at 50° C. The iodoform will settle to the bottom unless the mass be constantly shaken during the heating. A fluid mass which will reach every irregularity, side cavity, or crevice of the bone cavity is considered to be essential to the result. Another important factor is a perfectly dry bony wall.

The bone is widely and freely exposed by a curved incision which will give a definite flap. This flap includes the periosteum, and is shaped without reference to the location of sinuses. The bone is opened with a chisel

or electric saw, and the necrotic focus is thoroughly scraped out with a sharp spoon. The scraping should be continued until all diseased tissue has been removed, and then the cavity should be wiped perfectly dry and its interior swabbed with a 1 per cent. solution of formaldehyd. The cavity should now be dried by a stream of hot or cold aseptic air. The preparation of such a cavity will sometimes take thirty minutes. The iodoform mass is now introduced, with due regard to a complete filling of every corner of the cavity. Rubber tissue is then temporarily placed over the hardened mass, fistulæ are thoroughly curetted, the tourniquet is removed, the bleeding in the soft parts arrested, the wound sutured, and a dressing applied which remains in place for ten days or two weeks.

There is no danger of iodoform poisoning, because of the very slow absorption. The wound usually heals by first intention and the patient is able to resume work in six weeks. The subsequent healing of the bone-cavity can be very accurately followed by means of the X ray. Iodoform casts a much denser shadow than bone, and the gradual absorption of the iodoform, with a corresponding growth of bone from the interior of the wall, can be followed to the stage of complete absorption of the iodoform mass and complete regeneration and closure of the cavity with osseous tissue. A failure to retain the mass or its subsequent removal by operation did not occur in the 220 applications of the method. The method is, of course, not applicable in acute osteomyelitis, but in chronic circumscribed cases of the chronic type. The method has been applied with equal success to tubercular disease of the bones and joints; it has also been employed in packing four cases of dental cysts and two cases of empyema of the antrum of Highmore with excellent results.

The procedure here suggested may be used to advantage to fill up the space produced by the amputation of necrosed root tissue in the surgical treatment of chronic periapical abscess.

[*British Journal of Dental Science*, April 1, 1904.]

VARIATIONS IN THE ATMOSPHERIC PRESSURE AND THEIR INFLUENCE UPON THE INHALATION OF ANESTHETICS. BY H. BELLAMY GARDNER, LONDON.

The daily and even hourly variations in atmospheric pressure, to which the inhabitants of the earth are subjected, and that also which

is produced by distance from sea level, have a marked influence on the absorption and elimination of anesthetic vapors.

Sir B. W. Richardson had already pointed out that variations in temperature and in the relative amount of moisture in the air affected the inhalation of anesthetics, a moderately high temperature and a dry air assisting the vaporization of liquids and the elimination of gases from the blood.

The essayist has carried on a series of experiments the results of which are embodied in a table showing the available period of anesthesia with nitrous oxid and oxygen under different conditions of atmospheric pressure and temperature. We thus find that under a pressure of 29.35 inches the available period was forty seconds, and with a pressure of 30.44 inches the available period was fifty-seven seconds. Between these two experiments the period of anesthesia varied in direct ratio to the atmospheric pressure.

During the past three and one-half years the author has confirmed these observations in a large number of cases both in hospital and in private practice, and has come to the definite conclusion that a higher barometric pressure produces greater tranquillity and longer anesthesia, and that more oxygen or air may be admitted in these circumstances without excitement resulting from its presence.

These phenomena are precisely those which Paul Bert predicted from calculation and demonstrated by experiment in the air-tight chamber he had made for producing an increased atmospheric pressure during the administration of nitrous oxid and oxygen. Paul Bert's experiments were repeated by Claude Martin in 1883, who obtained better results by maintaining a pressure of 44 inches rather than the pressure of 38.8 inches advocated by Paul Bert.

Discussing the influence of barometric pressure upon chloroform inhalations, the author states that chloroform is more popular as an anesthetic in those places where barometric pressure is the lowest. The density of chloroform vapor is four times greater than that of air, and its potency upon the living organism is about seven times stronger than that of ether. As an inhalation it therefore forms what is generally considered an easy vapor, a few drams only of liquid, instead of ounces, requiring to be evaporated to produce unconsciousness, while the weight of the vapor itself tends to prevent its dissipation. These qualities, though rendering the fluid portable, and the apparatus required for its administration very manageable, are the true cause of danger to a patient who has been brought too close

to the state of chloroform overdosage, by rendering its elimination from the blood comparatively slow at the ordinary atmospheric pressures. Bearing in mind the factor of potency above mentioned, the reason for the difference in effect of low barometric pressure upon the anesthetic qualities of nitrous oxid and ether on the one hand and chloroform on the other becomes easily perceptible, for in the case of the first two drugs, which are comparatively weak anesthetics, we require to administer, speaking generally, as much as we can of them to attain tranquillity, and require a higher barometric pressure to help us in retaining them in the blood; but in the case of chloroform, so great is the potency for even small quantities of the vapor, and so narrow is the path that leads along the cliff between tranquillity and respiratory paralysis, that low barometric pressures will render it more safe by delaying absorption and aiding its elimination from the blood, and higher pressures on the other hand will render it more dangerous.

The difference between the results of the experiments on animals by the first and second Hyderabad commissions and the results observed in London and Edinburgh are attributed to the difference in atmospheric pressure between the three places named. The main atmospheric pressure of Hyderabad is below 28 inches, while that of Edinburgh is 29.84, and that of London between 29.94 and 29.95.

From the foregoing observations we gather—First: That during periods of low pressure or at altitudes where the barometer registers 29.4 inches and under, nitrous oxid will yield shorter available anesthesia. Further, that the less oxygen be mixed with nitrous oxid the shorter will be the period of excitement. Second: That ether does not produce as good results under conditions of low pressure as under high pressure. Third: That the administration of chloroform should be cautiously and carefully carried out in regions in which the pressure is high; thus in ordinary positions near sea level, where the pressure is equal to 30.2 or even 31 inches, one-third part of ether with two-thirds of chloroform, instead of chloroform alone, would materially increase the patient's safety, while pure ether would be not only indicated, but would be the surest agent.

[*Penn Dental Journal*, Philadelphia, March 1904.]

AN OPERATION FOR NECROSIS OF THE MANDIBLE. BY DR. M. H. CRYER.

That the sequelæ of neglected cases of root-canal infection may attain such serious proportions as to necessitate the removal of the

entire ramus of the jaw is shown by the case here reported. The patient, a young man of twenty-three, a resident of Salt Lake City, had been attended by a dentist for the treatment of a lower left second molar, the pulp of which had died consequent upon a traumatic injury. The pulp was removed and the canals were filled after having been thoroughly cleansed and sterilized, as he supposed. Shortly after this operation was completed the tooth was extracted on account of the violent pain which set in a few hours after the root-canals were filled. The pain did not cease. Instead, cellulitis and myelitis developed. For the following two weeks the patient was under the care of his family physician. In the meantime the third molar loosened and was extracted with the fingers. It was at this stage of the disturbance that the patient was referred to Dr. Cryer, who found upon examination that the region of the second and third molar was undergoing a necrotic process. It was then thought advisable to delay surgical intervention until a line of demarcation should be established between the healthy and necrosed areas. This occurred in about four weeks. The periosteum had separated, and the sequestrum involved the entire ramus including both condyloid and coronoid processes with the exception of a small portion which was still intact and attached to the temporal muscle. An intra-buccal incision was performed along the anterior border of the ramus and forward to about the level of the second molar, and the sequestrum was removed leaving the periosteum untouched. A few days after the operation the periosteum had begun to lay new bone, and when the patient was last seen the indications were that eventually an entire new ramus will be formed.

[*American Medicine*, Philadelphia, March 19, 1904.]

REFLEX CARDIAC INHIBITION RESULTING FROM IRRITATION OF THE PERIPHERAL FIBERS OF THE TRIFACIAL NERVE, OCCURRING IN THE COURSE OF AN OPERATION FOR CHRONIC EMPYEMA OF THE FRONTAL SINUS. BY GEO. FETTEROLF, M.D.

In this interesting report the author shows how stimulation of any of the branches of the trifacial nerve may bring about cardiac inhibition, and clearly explains the cause of that type of syncope occurring in the course of operations upon the teeth. He reports the case of a man in whom an operation was performed for the treatment of empyema of the frontal sinus. The interesting feature of the

operation was the occurrence of a "trigemino-cardio-inhibitory reflex." Each time the curette would be applied to the sinus wall there would be a marked diminution in the force, fulness, and frequency of the pulse, along with distinct cyanosis, and the curetting had therefore to be frequently interrupted. The particular area of the fifth nerve involved in the case under consideration was, of course, the mucous membrane of the sinus which is supplied by tributaries of the trifacial.

Discussing the nerve supply of the mucosa of the sinus we find the statement that in none of the standard text-books on anatomy can a description be found of the nerve supply of this region, and we are therefore led to believe that the author has overlooked a work entitled the "American System of Dentistry," wherein we find (vol. i, page 288) that the mucosa of the sinus is supplied by a filament of the deep or pericranial branches of the supra-orbital. The examination of a number of skulls led Dr. Fetterolf to believe that the principal source is from the supra-orbital with possible additional filaments from the nasal and malar branches of the temporo-malar, a conclusion which in the main is in harmony with the findings of Dr. Cryer, the author of the chapter on "Regional Anatomy" of the work already quoted. Dr. Fetterolf traces in a most comprehensive way the path of the impulse from the point of stimulation of the area supplied by the trifacial to the cardio-inhibitory fibers of the vagus, showing how irritation of any nerve filament of the fifth may exercise cardio-inhibitory action. The impulse runs, he says, "through the afferent fibers of the fifth to the Gasserian ganglion, then through the fibers of the sensory root to the deep origin which comprises the sensory nuclei in the floor of the fourth ventricle and the gray substance of the substantia gelatinosa of Rolando as far down as the second cervical nerve. From these situations the path to the nucleus ambiguus, which contains the motor centers of the vagus, is short and direct, and is probably through some of the fibers of the posterior longitudinal bundle. Normally the relations between the nuclei of the fifth and tenth cranial nerves are directed and controlled by centers situated higher up. This control is usually not materially interfered with during ether anesthesia, but when chloroform is used the connecting fibers between the two deep origins are given much freer play, and as a consequence any irritation of the peripheral fibers of the trigeminus may produce, through the cardio-inhibitory fibers of the vagus, an amount of disturbance which

may vary from only a slight degree of embarrassment to actual cessation of the heart's action. In this way may be explained some of those deplorable accidents which have occurred during adenoid and dental operations, and a safe rule to follow would be never to use chloroform when the area about to be operated on is supplied by sensory fibers of the fifth nerve."

This question is one of paramount importance to practitioners of dentistry, for the reason that the field under the care and supervision of the dental specialist is supplied mainly by the fifth pair of nerves. Many of the operations which the dentist is called upon to perform almost daily involve the infliction of irritation to filaments of this cranial nerve, varying in intensity according to the nature and extent of the procedure, and a disregard of the close relationship between the sensory nuclei of origin of the trifacial and the motor centers of the pneumogastric may bring about severe and dangerous accidents such as those pointed out by Dr. Fetterolf.

The literature of dentistry is replete with reports on shock, syncope, and other reflex phenomena caused by operations upon the teeth, and while the several authors have endeavored to describe the general manifestations resulting from an undue degree of trifacial irritation, nowhere have we been able to detect any tendency to trace the nervous impulse as has been so comprehensively done by the author of this report.

[*Wiener Zahnärztliche Monatsschrift*, Vienna, November 1903.]

REMEDIAL AGENTS FOR THE CONSERVATIVE TREATMENT OF TEETH. BY DR. WOLPE, OFFENBACH.

The author points out the disadvantages of employing preparations of unknown composition, and follows this by an account of the medicinal agents which he makes use of in the treatment of diseased conditions of the teeth. To protect the pulp, for filling root-canals and flat cavities in deciduous teeth, and as a temporary filling material the author employs a paste of eugenol and zinc oxid. The oxid should be incorporated into the eugenol and a sufficient amount of the former material should be worked into the mass in order to obtain the proper consistence. This paste adheres firmly to dry surfaces and serves beautifully the purposes for which the author employs it. To fill root-canals when the pulp has been devitalized by means of arsenous oxid the author recommends a paste of para-mono-chlorphenol and zinc oxid and a small quan-

tivity of geranium oil. To counteract the pain which frequently follows the application of arsenic for devitalizing purposes the author employs the following formula:

R—Morphinæ muriatis, gr. jss;
Acidi carbolici,
Olei caryophylli, āā gr. xv.

Sig.—To counteract pain following the application of arsenic.

For the treatment of putrescent root-canals Dr. Wolpe employs a combination of tincture of iodine 10 parts, ether 5 parts, and menthol 5 parts, and states that in his hands this formula has given satisfactory results.

[*Wiener Zahnärztliche Monatsschrift*, Vienna, November 1903.]

CHLORPHENOL IN THE TREATMENT OF PYORRHEA ALVEOLARIS. BY PROF. BERTEN.

Prof. Berten (*Odontologische Blätter*) recommends the use of chlorphenol in the treatment of pyorrhea alveolaris. A few crystals carried on the loop of a thin platinum wire are melted over an alcohol or Bunsen burner flame and applied in the gingival pockets. The application is repeated every three or four days. This treatment must be preceded by a thorough removal of calcareous deposits from the surfaces of the affected roots.

[*American Journal of the Medical Sciences*, Philadelphia, April 1904.]

FACIAL PARALYSIS. BY NORTON L. WILSON, M.D.

The author describes the branches of distribution of the facial nerve and the regions affected by lesions localized in their course. The so-called first branch of the facial nerve is the stapedius, supplying the muscle to the stapes; the so-called second branch is a twig to the pneumogastric which apparently comes off the facial trunk just above the chorda tympani. This, like the other filaments to the ganglion, is sensory and undoubtedly goes to the geniculate ganglion, being a part of the pars intermedia. The chorda tympani, considered the last branch of the facial in the Fallopian canal, is nothing more or less than a continuation of the pars intermedia, supplying the anterior two-thirds of the tongue with taste. There is therefore but one branch in the facial canal which actually comes directly from the nerve, namely, the stapedius, the other branches being all sensory and probably a portion of the pars intermedia.

In a case of lesion external to the stylo-mastoid foramen the paralysis of the facial muscles, including the orbicularis and frontalis, is not associated with disturbances of the senses of taste and hearing. If the lesion occur in the lower half of the facial canal, there is, in addition to the facial paralysis, loss of the sense of taste in the anterior two-thirds of the tongue on the affected side, and a diminished secretion of saliva, the lesion involving the chorda tympani and twig from the glosso-pharyngeal nerve. If the lesion be in the upper half of the canal so that the stapedius is involved and not the ganglion, there is, in addition to the symptoms above named, an abnormal acuteness of hearing, for tones of high pitch especially, because the paralysis of the stapedius permits the unhindered contraction of the tensor tympani, and a correspondingly increased tension of the sound-transmitting apparatus of the middle ear.

Concomitant paralysis of the soft palate is usually attributed to involvement of the superficial petrosal, assuming that this nerve comes from the geniculate ganglion. In this opinion the writer does not concur, regarding these filaments as sensory and not motor, and believing that it is the fifth nerve which innervates the palate and which is therefore the nerve involved when the palate is paralyzed. In support of this contention is the case of a man who fell a distance of eighteen feet and was picked up unconscious, bleeding from both ears. The hemorrhage from the ears continued for two days, and he was apparently totally deaf, both to sounds aerially conveyed and to the tuning-fork by bone-conduction. The left side of the face was paralyzed, and there was complaint of tinnitus and vertigo. There was a fracture of the base of the skull involving both eighth nerves and the seventh nerve of the left side. There was no sense of taste in the anterior two-thirds of the tongue on the left side, and on this side also the salivary secretion was apparently diminished. The uvula and soft palate were normal. Contractility of the muscles of the left side of the face was lost for the faradic current, but was apparently increased for the galvanic current.

Were the geniculate ganglion involved and the usual contention correct, the soft palate would have been affected, but in this case it was normal.

Where the cause of a facial paralysis is of otitic origin, attention must be directed to the cause, and the importance of the electric reactions, both as symptoms and as prognostic indications, must be duly regarded. Electric changes soon develop in paralyzed muscles,

and the reaction of degeneration, partial or complete, appears in four or five days after the paralysis occurs.

Electricity should not be applied, except to ascertain the excitability of the muscles, until the end of the third week. One month after the paralysis has occurred, electricity and massage should be used regularly and systematically. If the muscles respond to faradism, that current should be used; if they do not, galvanism is employed, but not without the galvanometer, in order that the strength of the current may be known and gradually increased if necessary.

[*Treatment*, London, March 1904.]

TRAUMATIC TETANUS AND CARBOLIC ACID. BY DR. E. BARBA.

The history related by the author ("Gl' Incurabili"), is that of a man of twenty-two who received an injury to the middle finger of the right hand, which at the time it was received became covered with earth. The wound was washed some hours after its infliction with corrosive sublimate solution, and was dressed. At the end of a month complete healing had ensued. During this time the patient was at work. Four days after the bandages had been finally removed the patient first complained of very severe pain in the right deltoid region, and at the same time a swelling was noticed occupying the region of the deltoid, and communicating to the shoulder-joint. By the aid of friction, with oil, in three or four days both pain and swelling disappeared; but at the same time a feeling of general malaise was experienced, and more especially lumbar and dorsal pains were complained of. Salicylates were ordered, but no relief followed their use. Soon a slight difficulty in the

articulation supervened, and the patient came under the author's care. It was clear that the case was one of traumatic tetanus. The adoption of the serum treatment would have involved the loss of three days, which period was necessary for the arrival of the medicaments. Hence the author was determined to make use of Baccelli's treatment. The patient was now in a most dangerous condition; the jaws could not be opened, the muscles were rigid, and from time to time attacks of opisthotonos supervened.

He was ordered 4 grams of potassium bromid and 2 grams of chloral hydrate, which were with difficulty introduced into the mouth between the teeth, and carbolic acid was injected hypodermically. The injections were given at intervals of four hours, and in twenty-four hours 30 centigrams of carbolic acid, dissolved in vaselin oil, were administered. The room was kept as quiet as possible, and a nourishing diet was ordered. This treatment was continued, the dose of carbolic acid being gradually increased, for twelve days. On the eighth day a distinct improvement was noticed; trismus was less marked, and the convulsive attacks were less frequent. On the twelfth day carbolic acid was found in the urine, and a marked acneform rash was perceptible over the whole body. It was obvious that intolerance of the carbolic acid treatment had developed, and the administration of the drug was suspended, but the patient continued to take the bromid and paraldehyd. A week later, the conditions having remained more or less stationary, the carbolic treatment was renewed, 40 centigrams being given in the twenty-four hours. From this time rapid improvement supervened, and the patient left the hospital perfectly well after a month's stay.

PERISCOPE.

Thrush.—A dram of sodium hypophosphite to an ounce of rose-water makes an excellent mouth-wash for thrush.—*Texas Medical News*.

Vaselin for Lubricating.—Use vaselin on your handpiece. It will not "run" like oil and soil the bur or your fingers. Also use vaselin on the rubber dam and it can be more easily adjusted.—A. W. THORNTON, *Dental Review*.

Method of Making Surface of Wax Smooth.—A smooth surface on a "waxed-up case" can be obtained without spoiling festoons or gum carvings by adopting the following method: Smear the surface of the wax with a pellet of cotton saturated in chloroform. Burn off the chloroform with an alcohol lamp or a small Bunsen flame. This will leave a smooth, glossy surface on the wax and will not destroy previously carved gums.—H. H. HANCOCK, *Dental Review*.

How to Handle Small Inlays.—To overcome the difficulty of handling small inlays while cementing them in place, fasten the end of a wooden toothpick to the inlay with sticky-wax. If the cavity is nearly round, mark the gingival side of the toothpick; this will be a sufficient guide to insure proper placing of the inlay.—ARTHUR E. PECK, *Dental Summary*.

Treatment of Specific Ulcers.—In specific ulcers repeated application of the following will produce healthy granulations at the base of the ulcer:

R—Acidi carbolici,	gr. xv;	
Alcoholis,	℥iv;	
Glycerinæ,	℥j;	
Aquæ q.s. ad	℥iv.	M.

Sig.—To be applied locally.

—*Monthly Cyclopædia of Pract. Med.*

Gum Sections vs. Plain Teeth.—If the same amount of time were spent in grinding and articulating blocks that is consumed in polishing pink rubber between the teeth, there would be less prejudice in this matter. The principal objections to gum sections are the tendency to dark joints, checking, and the accumulation of secretions back of them—all of which can be prevented by proper grinding and waxing.—O. H. SIMPSON, *Western Dental Journal*.

Porcelain Inlays.—I do not claim that the porcelain inlay can be put just anywhere in the mouth, nor do I think it desirable to do so. But in the anterior teeth, where other filling materials become conspicuous and disfiguring, it is the great desideratum—the *ne plus ultra*—of our present attainments. Then again, where there are frail enamel walls which it is desirable to preserve, the porcelain inlay meets a long-felt want.—C. A. ROMINGER, *Dental Hints*.

To Harden Plaster Casts.—Dissolve one part alum (free from iron) in five and a half parts hot water. Immerse the cast and allow to remain from half an hour to several weeks, according to size and bulk. After it has absorbed a sufficient quantity of the solution, remove, and from time to time drench with the same solution, until a coating of crystallized alum is formed over the entire surface. When thoroughly dry polish with sand-paper, and finish by rubbing with a dry cloth. The product will be a hard, dense mass of fine texture, extremely white, showing a high polish resembling Carrara marble.—*Brit. Journ. of Dental Science*.

Remote Disorders of Dental Origin: Their Cause.—I am exceedingly skeptical of those cases of so-called reflex ocular or aural disease of oral origin, where intense inflammatory or purulent conditions are present in the eye or ear. I believe such diseases to be produced either by the migration of infectious micro-organisms, through the nervous or vascular structures, or else by the extension of inflammation by periosteal or mucous tissue.—FRANK ALLPORT, *Dental Review*.

Convenient Device for Heating Rubber.—Procure an ordinary white china plate about a quarter of an inch thick. Cut enough rubber for the case and place on the plate. Then place the plate, with rubber on, over the vessel used to heat water for washing out the wax. When the water reaches the boiling-point the rubber is softened sufficiently to pack nicely. The plate holds the heat long enough to pack two full cases. This makes a neat and convenient method of heating the rubber and saves time.—C. E. BELLCHAMBER, *Dental Review*.

Soft Water a Cause of Carious Teeth.—In some portions of Lancashire, England, there are towns in which edentulous mouths are the rule. An excursion party was inspected in Blackpool, and an average of three teeth was found in the company—made up of men, women, lads, and lasses. I was told that in the district from which these people came, the drinking-water was devoid of mineral or calcic elements, and the teeth simply crumbled away in childhood. In Glasgow, which is supplied with soft water from Loch Katrine, the people's teeth are notoriously bad, while in Birmingham, where the water is hard, the teeth are of better structure and more durable.—*Exchange*.

Protective Dressing for Pyorrheal Teeth.—After cleansing the roots of tartar, etc., and treating them with lactic acid, I dry the parts as perfectly as possible, then rub with alcohol to dry the roots. I then place over the parts bits of Japanese paper saturated with liquid celluloid, so as to form a protecting wall over the roots and edge of the gum. After that is done I take a thread and wind it around and tie it, to prevent all possibility of the paper getting out of position. The covering hardens and forms a perfect shield to the granulations, which grow up and fill the spaces between the roots. I have several cases in which the gums are growing in nicely.—W. J. YOUNGER.

Cavities in Molars and Bicuspsids should Include Part of Occlusal Surface.—As a general rule we may say that all approximal cavities in molars and bicuspsids should be made to include the occlusal surface to such an extent that the cavity will be the same size all the way to the gingiva, because the cavity must be filled from the occlusal side; but in incisors and canines the operator is especially left to exercise his own individual skill in manipulation. The areas of liability in these teeth are so small and are influenced to such a marked extent by surrounding conditions that, unless the tooth-structure has already disintegrated, the matter of extension becomes one for gaining access rather than for prevention.—CHARLES E. SLAGLE.

Articulated Models in Operative Dentistry.—To logically acquaint a patient with the true state of his teeth, something more than the expression of opinion or the quotation of the dental authorities on the subjects involved is required, and nothing is so good for the purpose as articulated models of the patient's teeth. It is the work of but a few minutes to take a modeling-compound impression—absolute accuracy is not required—and to run plaster models. While these are setting, a filling may be inserted, calculus removed, or any initial operation demanded by the case may be performed. Before the patient leaves the office—or, if the first sitting has been for examination only, before the next sitting commences—he may be shown the articulated models of his teeth, and nothing else will so convince him of their true condition and the necessity for intelligent service.—FRANK L. PLATT, *Pacific Dental Gazette*.

Care of Children's Teeth.—My first suggested remedy was one that depended upon each professional man's own effort to educate and instruct his patients—a very limited class, and therefore a very limited effort, attended by an equally limited result. The second remedy I would suggest must depend upon nothing less than the help of the state itself. It has to deal with a field so extensive, with numbers so vast, that nothing less than systematic treatment on a large scale can be in any way effectual, and such treatment can only be obtained by having recourse to government assistance. The remedy is really very simple, but in order to be effectual it must be very thorough. Put shortly, it is that the government should appoint dentists to every national school, the duty of each being to give his undivided attention to the children

attending the school, so that every child in the school should pass through his hands and obtain the benefit of his attention and skill.—*Treatment*.

The Finsen Light.—The Finsen light is a large specially constructed arc lamp of 20,000 candle power, or twenty times stronger than an ordinary street lamp, and uses from sixty to eighty amperes of current. This lamp burns a specially made carbon, which can only be procured at Copenhagen. In the upper holder is a large carbon, while a smaller is used in the bottom holder; when properly adjusted for arking a maximum number of violet and ultra-violet rays are produced.

The advantage of the Finsen lamp over others is in the greater number of violet rays produced. The Finsen lamp produces a much greater number of chemical rays than does sunlight, as the atmosphere absorbs a large percentage of these rays. The light is so intense that it is impossible to look at it with the naked eye, and it is necessary for all the attendants and patients to wear dense smoked glasses while the lamp is in operation. An aluminum hood about two feet wide surrounds the lamp, which hood is fringed on its lower border with a deep crimson-colored paper skirt to further aid in excluding the diffused light from the patients.—H. JOHN STEWART, *Pacific Dental Gazette*.

Lupus and the Light Cure.—It has been a popular belief that lupus is a very rare disease, common only in the northern countries; and although it has been supposed that there was no lupus in London, yet the hospitals are now treating 175 cases daily, and the management of the London Hospital has been compelled to install two more lamps and build a separate department, so great has been the demand from people seeking relief. Lupus was considered very rare in the United States, but since the establishment of the Finsen Light Institute in Chicago, the author is informed, those in charge have been taxed to their utmost capacity and have found it necessary to increase their facilities, as there are now patients on the waiting list who are not able to receive treatment. It seems but a question of a short time until light institutes will be established in every large city in America, from the fact that the treatment has proved efficacious in many other skin diseases besides lupus and rodent ulcer, viz, in such as acne, alopecia areata, localized eczema, chronic ulcers, and nevus.—H. JOHN STEWART, *Pacific Dental Gazette*.

Removal of Salivary Deposits with Smooth Scalers.—From experience in practice, and watchful observation of results following treatment, I feel justified in saying that any practical dentist of fair comprehension, can, after a few hours' observation of the use of smooth scalers in the removal of deposits, be able to manipulate such instruments effectively, and will fully realize in a limited period of time that the deposits can be removed more quickly and thoroughly than with sharp scalers, and will feel satisfied that successful treatment of the disease is possible with the whole profession, if desired; that all can treat and cure if they will, and that all this extravagant, sensational talk and writing about the disease and the difficulty of treatment and cure is unnecessary and unauthorized, and cannot be sustained by facts demonstrated through a correct line of practice or otherwise.—B. F. ARRINGTON, *Internat. Dental Journal*.

Practical Points in Inlay Work.—In making inlays of low-fusing body, proceed in the following manner: Apply the dam, not for the purpose of keeping the cavity dry, but to give a clear working space. Use rolled gold No. 30 unannealed for the matrix. In getting the impression use wet cotton pellets for packing instead of chamois disks, as when wet the cotton will remain where it is placed, thus overcoming the tendency to slip when the matrix is being burnished to the cavity edge. Remove the matrix by means of the chip-blower, thereby relieving pressure brought to bear on any special point—as in a case where an instrument is used. After the inlay is baked, cover the outer surface with a thick coating of paraffin, letting it run down on the gold as well. When cold, peel the gold from the paraffin and inlay with the pliers, and cover the exposed surface of the inlay with hydrofluoric acid. Let stand until the acid has exhausted its strength. Hold the paraffin in cold water and chip it from the inlay, leaving it ready for insertion.—ROBERT BRUCE GENTLE, *Dental Brief*.

Reflex Phenomena Due to Diseased Teeth.—We have all seen a severe toothache produce neuralgia, redness of the eye, and excessive weeping, but we must not be too quick to conclude the tooth to be an etiological factor; not, indeed, unless the neuralgia and ocular conditions promptly disappear upon a cure of the dental disease. The outlines of cause and effect, however, are sometimes beautifully demonstrated, as for instance in a case cited by Hutchinson in 1885. He ob-

served a marked case of lagophthalmos from spasm of the levator palpebræ superioris, which promptly disappeared upon the removal of an aching tooth; and Vossius, in the *Archives für Ophthalmologie*, vol. xxxiii, mentions cases of exophthalmos developing from serious infiltration of the orbital tissue, which disappeared rapidly after extracting a diseased tooth. Instances of this nature have also been observed by Burnett in 1885 and Pagenstecher in 1884; and Dimmer, in the *Wiener med. Woch't* for 1883, page 299, claims to have seen metastatic choroiditis produced by reflex irritation from extracting a tooth.—FRANK ALLPORT, *Dental Review*.

Dental Educational Ideals.—The realm of physics, chemistry, and biology is to be drawn upon in almost every operation of any consequence which we undertake. Can anyone afford, then, not to be familiar with at least the fundamentals of these sciences? And should he not be able to make application of their principles from his own knowledge, rather than, as is too often the case, use the principles in a sort of automatic way, because someone has said cavities should be so formed, or because experience may have taught us that such and such treatment will produce certain results? Is it not true that we do too large a part of our work empirically?—our teachers taught it so, or we found it worked well, and we are satisfied to go on doing it so without stopping to reason out its philosophy, losing thereby one of the greatest benefits and pleasures in life—that of thinking for one's self. Learning for the sake of making a technical application of it is well worth our getting. And while we are getting wisdom and strength of character from learning, should we not also have in view the highest ideals of skill?—N. S. HOFF, *Dental Headlight*.

On Root-Filling Material.—A good many definitions have been given of what a root-canal filling should be, some of them too long and too special. I think we can agree on two necessary qualities: The material should fill the canal, and it should remain unchanged. Some might desire the two additional qualities, ease of insertion and ease of removal. I do not include them, for while there is no virtue in difficult manipulation, we at no time admit the propriety of any method because it is simply easy; and thus, too, I feel that the filling with gutta-percha, especially the solution of gutta-percha and chloroform, is about the dirtiest, sloppiest method we have. And the second point, ease of removal, has no real

weight, if we find a material that does away with the need of removal. Gutta-percha is usually employed at first in solution in chloroform, this to be followed by points or cones so condensed as to make the material as solid as may be. But the very best condition attainable with gutta-percha would seem to be a mass of material moistened with chloroform, which sometime will pass out of this material, either by evaporation or endosmosis, leaving a shrunken cone only partially filling the cavity. This explains in part the almost universally admitted fact that a gutta-percha canal-filling has a bad odor.—C. W. STAINTON.

Supernumerary Teeth.—This cast shows two supernumerary teeth, which, I believe, are supplemental to the lateral incisors, notwithstanding their being similar in some respects to miniature canines. In this case the condition is doubtless hereditary, as the mouths of two sisters exhibit abnormal conditions. They could not understand the English language sufficiently for me to explain



to them fully what I wanted to do, and for this reason I was unable to obtain impressions of their mouths. The oldest girl had a lower supernumerary bicuspid on the right side. The youngest is minus the lower first molar on the same side, it never having erupted. The second molar is in its place. The second bicuspid was rotated one-half, and touched the second molar, leaving a space between the two bicuspid large enough for a molar tooth.—R. G. PALMER.

The Practicability of Certain Phases of "Extension for Prevention."—The extension of every approximal cavity cervically to beneath the free margin of the gum, and in bicuspid and molars well across the occlusal surface of the teeth, with well-prepared seats and steps and angles for the retention of the filling, may be correct in theory, but in practice is not universally necessary, as is proved by the prolonged usefulness of many fillings in cavities not so extended. Extension for prevention is certainly provocative of a horror of the dental chair that is not com-

plimentary to the profession or its practitioners. The correct use of tin foil, amalgam, and gutta-percha, and the application of lining materials to frail or sensitive cavity walls—in short, the selection and practical utilization of proper filling materials—will save teeth without needless torture and an unnecessary expenditure of time and endurance on the part of both patient and operator. There is a middle course which may be followed in dental operations which will prevent both slovenly, unfinished work on the one hand, and needless infliction of pain on the other. In the treatment of young patients, children experiencing their first introduction to dentistry, this course is most certainly the best, and need not be made to overtax the endurance and courage of anyone.—*Pacific Dental Gazette.*

Treatment of Cavities in Labial and Buccal Surfaces.—In my experience with decay in labial and buccal surfaces of the teeth I have found most trouble with the buccal surfaces of molars, and as we cannot remove the cause before we repair the damage, mechanical skill is the first requirement. Whenever it is possible to replace all of the discolored and softened enamel in these labial and buccal gingival cavities with a proper filling, one will not be apt to have recurrence of decay. But we very often find, and especially on the buccal surfaces of molars, a complete line of whitened enamel extending from mesial to distal and including part of these surfaces, with but a small place in the central buccal surface where the enamel has broken through and decay of dentin has begun. These cases present a problem, to me at least. All of this whitened portion cannot be cut away, as most of the whitened area will be found very hard except a very thin softened layer on the surface, with perfectly healthy dentin underneath. Even with the best of care a perfect margin for filling cannot be obtained, and we know that sooner or later some portion of this white enamel will soften and decay will come again—possibly not just at the margin of the filling, either, but it may be at some little distance on either side. Here is where careful work will show itself.—LEONARD STRANGE, *Dental Summary.*

Wire Ligatures.—From time to time in our literature it has been recommended to use the wire ligature instead of silk in connection with the application of the rubber dam, but this recommendation has not met with a wide adoption. The reason probably is that no suitable wire has ever been found.

Recently an attempt was made to use such a ligature, making use of the ligature wire prepared for those who adopt the Angle method for regulating teeth. The success was most gratifying, and this Angle ligature wire will be found extremely useful in many difficult cases where the cavity has a margin extending beneath the gum. The ligature wire can be applied and twisted firm and then pressed so as to expose all portions of the cavity, the wire remaining in place, which, of course, the silk would not do. Another mode of using the wire, suggested by Dr. J. M. Thompson of Detroit, also serves a useful purpose. In this mode the wire is first doubled into a loop, and the loop end twisted so as to form a tight rope-like end. The two ends of the wire are then spread apart, then around the tooth, and twisted on the opposite side of the tooth to be filled. This is then cut off, and we now have a twisted loop of wire on both the buccal and lingual aspects. These are so bent as to lie over against the tooth, the rubber is slipped on, and the ends turned back. By this means the rubber can be held even on a short tooth where it would be difficult to use a clamp.—R. OTTOLENGUI, *Items of Interest*.

A Point in the History of Antisepsis.—It remained for the great English surgeon, Dr. Joseph Lister, to first extensively apply the principles of antisepsis in the domain of surgery, and rightly he is called "the father of antiseptic surgery." The publication of his important paper entitled "On the Antiseptic Principle in the Practice of Surgery," which appeared in the London *Lancet* in September 1867, marks the date of the birth of the true antiseptic era. Great discoveries and inventions, however, which revolutionize existing conditions are seldom the product of a single brain. Watt's invention of the steam engine in 1736 was preconcepted by Papin in 1690, who was the first to apply steam to produce motion by raising a piston. The discovery of America by Columbus in 1492 was merely a following up of prior discoveries made by the hardy Norseman, Lief the son of Eric, who about A. D. 1000 followed the route of Bjarne and sailed along the eastern coast of Canada, discovering Labrador, Nova Scotia, and the outlet of the St. Lawrence river. So the discovery of antiseptics is not to be credited solely to Lister. Prior to the publication of his epoch-making essay, the writings of Pringle, Müller, Chaumette, Sivent, Bayard, Caignard de la Tour, Schwann, Pollender, Davainne, and Bayer, Panum, Schmiedeberg, Pasteur, Bergmann, and others, laid the foundation upon which

Lister could solidly build his conception of wound-treatment.—HERMANN PRINZ, *Dental Headlight*.

Pathological Changes in the Eye and Ear caused by Diseases of the Mouth.—

Diseases of the mouth may produce pathological changes in the eye or ear by one of two channels, viz, by direct continuity of tissue or by reflex irritation. We must not, however, lose sight of the fact that many diseases whose underlying cause has been ascribed to an elusive reflex phenomenon have been shown to have their origin in an actual migration of micro-organisms along nerve fibers. Neither should we allow the pendulum to swing too far the other way in this age of doubt and materialism, to the elimination of all reflex pathological conditions, for it surely is difficult to harmonize the theory of septic infection with a prompt disappearance of subjective and objective phenomena upon the removal of the offending cause—such, for instance, as a tooth. As illustrating the point, Milliken reports a case of a healthy man who contracted two attacks of iritis; the first came on with the cutting of a third molar and disappeared upon the subsidence of the gingival inflammation. The second attack came on after losing a filling in the third molar upon the same side as the eye, and was immediately relieved after the tooth was excavated, sterilized, and filled. There was no apparent septic invasion of the iris, and the prompt disappearance of inflammation upon the removal of the irritating cause would seem to argue against the theory of septic migration.—FRANK ALLPORT, *Dental Review*.

Preparation of Cavities in Molars and Bicuspids with Special Reference to the Cervical Wall.—

We must bear in mind, especially with reference to approximal cavities in bicuspids and molars, that the base must be made to support practically the entire weight put on the filling during mastication, thus preventing any lateral pressure, which would tend to fracture. This would mean that the base of the cavity be made to represent a horizontal plane surface, extending from the buccal to the lingual side of the cavity. It should be a little lower where it joins the axial wall, but must be a gradual incline and never grooved. The buccal and lingual walls should be at right angles to the base, and as they pass toward the axial wall should converge to such an extent as to keep in line with the enamel cleavage and in the same general direction with the dentinal

tubules, thus precluding the possibility of cutting off the nutrient supply to any part of the dentin. The axial wall should be flat and meet all the other walls of the cavity at a definite angle. The real anchorage seat of these cavities should be in the occlusal step cut at right angles to the approximal part of the cavity, which, fortunately, does not very often call for the sacrifice of any considerable amount of tooth-structure, because the occlusal surfaces are generally already in need of attention. Having extended the cavity in all directions, we must use every precaution—with reference to the surrounding structures—in building the filling so that none of the boundary lines of the original area of liability will change.—CHARLES E. SLAGLE, *Dental Brief*.

How to Determine the "Sufficient Dose."—Contet (*Gazette des Hôpitaux*) endeavors to show that better results could be obtained with remedies if physicians could employ some clinical sign or signs which would be evidence of the sufficient physiological activity of the substance given in any case. Patients and diseases vary so much that it is impossible to state "the sufficient dose," and this usually has to be determined empirically, often to the detriment of the patient. He employs a method, suggested by Gilles de la Tourette, who utilized it in the treatment of epilepsy. Among other symptoms produced by the bromids he fixed upon the disappearance of the pupillary light-reaction as the clinical sign to be used as a guide. He commenced with very small doses and increased until this sign of intolerance appeared. This was considered the evidence of saturation, and the therapeutic dose was governed accordingly. Dr. Contet applies this principle in giving other drugs. In mercury, for instance, the clinical sign is the fever of mercurialization; the administration of this substance for its systemic effect should be carried on with the thermometer as a guide; when fever follows its use the quantity should be reduced just below that which produces this symptom. Nitroglycerin is another example; the clinical sign of sufficient vasodilatation is the production of slight headache. It would be interesting and useful, Dr. Contet says, for the physician to know a clinical sign of easy observation for every medicinal substance, analogous to those just quoted, in order to be able to judge, other than by therapeutic results, of the activity of the agent employed. In the same way the author advocates the giving of fractional doses until desired results are obtained.

Thus, in giving chloral or opium the physician is often at a loss as to the size of the dose necessary to produce the desired result. Rather than give a single dose of uncertain effect, is it not better to divide the dose, giving every hour, half-hour, or even quarter-hour, until the desired sign of action appears, as relief of pain from opium or sleepiness from chloral—avoiding of course the danger-point in dosage?—*Monthly Cyclopedia of Practical Medicine*.

Dental Treatment during Pregnancy.—

It is supposed by many that the teeth should receive no operative treatment during pregnancy. I believe that many cases have received judicious treatment during this period, and have been benefited without hazard to the patient. It would be unwise to allow a woman to suffer with neuralgia, odontalgia, alveolar abscess, carious bone, or diseased antrum, which may involve intense pain or suppurative conditions which may affect the general health. Indigestion or gastric intestinal conditions are provoked by pus absorption, and the suffering and inconvenience which a woman would ordinarily endure if these conditions were to continue, would to my mind be as great a tax on the nervous system as the stages of labor. Loss of sleep, nausea, and irritability would be accentuated by constant or frequent attacks of pain, consequently weakening the system, and possibly inducing miscarriage. As a rule, only temporary operations should be performed on the teeth, especially if the patient is of the neurasthenic type. Some women claim that they never feel better than when pregnant; in such cases permanent work might be done with impunity, providing the teeth are not excessively sensitive and can be filled without much inconvenience. The greatest care and tact are often necessary to accomplish the simplest treatment for some women; consequently any attempt to prolong sittings, as is often necessary in filling teeth, would result in failure of the operation, and possibly with disastrous results. All diseased teeth which cannot be saved and which give rise to irritation or become the seat of abscesses should be removed, under an anesthetic, to avoid any great shock.—C. H. OAKMAN, *Dental Register*.

Gutta-Percha Plates.—Having the articulated model, use vulcanizable gutta-percha just as you would base-plate wax, setting up the teeth in the ordinary way, making the whole plate of this material except a portion on the buccal and labial portion, of about the

thickness of an ordinary sheet of base-plate wax—this is to be made of pink rubber. Having done this, try the plate in the mouth to get the articulation, and make any alteration that may be necessary. Then remove all the teeth from the plate by heating them slightly. Next cut a piece of pink rubber sufficiently wide to extend from the imprint of the pin in the gutta-percha to the rim of the plate, and long enough to extend externally from heel to heel of the plate. Soften this somewhat by heating a little and also the surface of the plate to be veneered. Put pink rubber in place and heat each tooth at neck separately, press it into the pocket it originally occupied, carrying the pink rubber with it—at the same time pressing the rubber to the gum surface all around—and cut off the surplus. Again try in mouth to see that articulation is correct. Next by use of rubber cement—made by dissolving pieces of gutta-percha in gasoline—cement plate to model thoroughly; invest with one mix of plaster, being careful not to get any bubbles, place the bolts in the flask, and vulcanize in the usual way. In finishing up, use only a stiff brush wheel and pumice and chalk on gum surface, and finish the other parts of the plate as usual. This, I think, makes a more natural gum surface than can possibly be made in the usual manner by carving, etc. Another advantage is the trial of the plate in the mouth just as it will be in the finished form, for there can be no possible change, as there is so likely to be in the use of rubber, separation of flask, and other tedious processes. Another advantage, and a most important one to a busy dentist, is the saving of time, as a plate can be made and finished by this method in at least half the time consumed by the use of rubber, etc.

The only question of doubt is as to its durability. Will the gutta-percha stand the test of time in the mouth? So far I have only been able to find a small article relative to this, and that states that in time it will become so brittle as to almost break at touch. But I have it indirectly from some who have used it for years, that it is just as durable as rubber.

The gutta-percha used is a combination of the juice of a forest tree grown in Borneo and Sumatra, and sulfur and vermilion, very similar to the combination used in making rubber.—A. S. PAGE, *Dental Summary*.

"Theoretical" and "Practical."—Knowledge is gained primarily through the different senses, of which sight, hearing, and touch are the most important. We must further distinguish between clinical or practical

work, in which experience is gained at first hand, and so-called theoretical work, or the accumulated experience of others conveyed by means of lectures and books. Each of these classes is essential for the proper understanding of any practical science. The man who relies too much upon his lectures and books will possess that kind of knowledge which is frequently miscalled theoretical; it is not really theoretical; it is condensed and comprehensive knowledge which is true, and may have definite and distinct practical bearings. The weakness of its possessor lies in his inability, owing to want of familiarity with actual practical details, to so apply his knowledge as to be able to deal successfully with the cases that come before him. On the other hand, the man who has neglected these opportunities in favor of an extensive clinical experience is, on the whole, perhaps, in a more happy position, but his defects are very obvious. Owing to the impossibility of his attaining anything like a complete acquaintance of even a small subject, his knowledge is scrappy, disconnected, unequal, and wanting in co-ordination. He has, as it were, endeavored to learn his subject afresh; he has neglected to avail himself of the advantages of the crystallization of knowledge by time, and his sense of proportion and perspective is defective. The art of remembering consists partly in perfect observation and understanding of the point before you, and partly in its connection with previously-acquired items of information. It is much easier to remember some scientific truth, or observed fact, which has a definite bearing upon the general scheme of things, than one which stands alone. There is, if I may say so, far too great a tendency among students to regard their book work and their practical work as two distinct things. Such a view is fatal to good knowledge. It is absolutely wrong to do as so many do, and rely upon practical and clinical work for the acquirement of information during the first year or year and a half of your hospital course, and to turn to your books merely for the purpose of learning up so many facts for examination purposes. Both avenues should be traveled concurrently—or at least alternately. It is true that a first reading of a book on a subject of which you have no practical knowledge will apparently teach you very little, but it will give you a general idea of the systematic arrangement of things, and enable you to tick off, as it were, in your mind the various details as you come across them at random in practice. This will enable you to refer more

readily to your books for the explanation of those difficulties which occur to you from time to time.—NOBMAN G. BENNETT, *Dental Record*.

Discoloration of Gold Fillings.—Discoloration of gold fillings, even in the early days of the use of the material, attracted the attention of the profession, and various reasons were offered for this, which today are still recognized causes. Among these may be mentioned improper cavity preparation, including insufficient removal of decay and insufficient marginal extension. In the former defect, the gold next the floor and cavity walls, being necessarily not well condensed, becomes very absorbent to the products of the progressing caries under it. This process extends to the margins of the filling, and a discolored edge results, due to the penetration into the substance of the filling of the products of the carious process. In the latter defect, the failure to extend the margins not only does not hide the filling completely and prevents the light from being reflected directly forward from it (I am referring particularly to approximal fillings in the anterior teeth), but also by its very position prevents access to all cleansing agents—the saliva, the lips, and the tooth-brush—and has not the appearance of the perfect gold filling. Another frequent cause is insufficient surface condensation. The operator's attention may be diverted while condensing the last layers of gold, and he fails to obtain the proper finish. He burnishes, polishes, does not dare to make new imprints with the mallet into the already flush surface, and the filling lacks that

smooth, glossy polish of the perfect gold filling. Such a surface, as well as the dull pumice-stone finish, is very inviting to discoloration. Still another cause is the incorporation into the gold of foreign substances during the insertion of the material. This may happen in connection with combination fillings. Scraps of tin, amalgam, or metallic flakes from the instrument used will in time mar the surface of a filling. Here it may also be mentioned that excessive burnishing with steel instruments tends to discolor gold fillings. Combining tin with gold to fill at the cervical margin or the major part of the cavity, or combining amalgam with gold—in all such combinations, if extreme care be not taken in finishing, the baser metal will be rubbed on or impregnated into the surface of the nobler metal. Even the very fact that a large mass of amalgam is in contact with a small mass of gold may, in the course of time, produce a slight discoloration in the gold. Furthermore, there may be a possibility that the fineness of the gold used is at fault, though this can hardly be the case at the present day. The action of sulfids, either taken in with the food or produced chemically in the mouth, is another reason for discoloration, and these agents are invariably present to a greater or less extent in all mouths. The mouths of febrile patients, as well as those of some in health, are often found to be in an exceptionally dry state. Such a state is very favorable to the action of chemical agents and organic forms of life, and a deposition takes place which is a common cause for discoloration.—PAUL B. ENGEL, *Dental Headlight*.

OBITUARY.

MR. JAMES SMITH TURNER. M.R.C.S., L.D.S.

DIED, February 22, 1904, in London, Eng.,
MR. JAMES SMITH TURNER.

The death of James Smith Turner constitutes an irreparable loss to the dental profession the world over. Energetic, zealous, self-sacrificing, he spent his life working indefatigably for the advancement of the profession, regardless of self, but entirely to win a solid, honorable, and legalized status for the profession to which he belonged. He was the guiding force in many reform movements

in England, and already in 1857, when he was but twenty-five (having been born in Edinburgh in 1832), we find him actively engaged in society and educational work.

His connection with dentistry dates from 1853, at which time he arrived in London, after having acquired a good practical knowledge of dental mechanics under a dentist of his native city. In 1863 he passed the required examinations and became an M.R.C.S. and an L.D.S., having trained himself for those degrees at the Middlesex Hospital, with which institution he was subsequently asso-

ciated for over forty-five years in the capacity of lecturer on dental surgery, dental surgeon, and consulting dental surgeon. In 1872 he was appointed to the lectureship on dental mechanics at the London School of Dental Surgery, which position he filled until 1878.

The matter of legalizing and systematizing dental education and dental practice in England was a question which in 1870 was occupying the attention of every member of the dental profession who had the welfare of his specialty at heart. Efforts were being made incessantly to bring together into a solid organized unit, at least for the time being, all the dentists of the kingdom, with the view to carrying into the legislative body of the land proper resolutions—backed up by the elements thus united—for the meritorious purpose of inducing that body to frame and promulgate statutes that would protect the public from the ignorance and incapacity of unscrupulous self-styled dentists. A preliminary meeting was held in Manchester, and this resulted in the formation of the Dental Reform Committee, with Mr. (afterward Sir) John Tomes as president, and the subject of our sketch as honorary secretary.

The committee worked arduously, surmounting obstacles placed in their way by the unethical element, which saw in the proposed act a barrier to unprofessional methods of attracting patronage and conducting their business. Mr. J. Smith Turner, during the four years the battle lasted, labored constantly, spending considerable time and money; and finally, when the "Dentists Act" received the royal assent, on July 22, 1878, he had won a victory which stands out in his career as an example of his devotion to the profession and to humankind.

The work of the Dental Reform Committee having come to an end, Mr. Turner realized the imperative necessity of organizing a permanent body to assure and execute the mandates of the newly promulgated act. He called a meeting of the Reform Committee, and from that meeting sprang the British Dental Association, the representative body of the profession in the British Empire.

The principal force instrumental in the passing of the "Dentists Act," the founder and moving spirit of the British Dental Association, he recognized also the necessity of organizing a journalistic mouthpiece, an

authoritative literary organ, and once again we find him actively engaged in bringing to a successful issue this his third memorable innovation. His efforts culminated in the appearance in 1880 of the *Monthly Review of Dental Surgery*, and for fifteen years he supervised the work of publication.

He was president of the Odontological Society of Great Britain, examiner on the dental section of the Board of Examiners of the Royal College of Surgeons of England, and president of the British Dental Association in 1891.

The dental profession of England, recognizing the untiring efforts of Mr. James Smith Turner for the advancement of dentistry, and the fruitful results of his devotion to the cause, at a specially called meeting in 1880 presented him with an inscribed clock and a purse, as an expression of appreciation. Another testimonial of gratitude was given him by the British Dental Association in 1890, when at its annual meeting at Exeter a portrait of the deceased was presented to the association and a replica to Mrs. Smith Turner.

The foregoing sketch is, the writer acknowledges, both incomplete and inadequate; it may, however, serve to familiarize the profession outside of his immediate sphere of influence with some of the most important events in the life of a man who justly deserves the appellation of "pioneer of modern dentistry."

[We are indebted to the courtesy of the *British Dental Journal* for the data upon which this sketch is based.—ED.]

DR. BENOIN S. BROWN.

DIED, at Onset, Mass., March 31, 1904, from heart failure, Dr. BENOIN S. BROWN.

Dr. Brown was born at Pawlet, Vt., June 13, 1820. He entered upon the study of dentistry at the age of twenty, under the tutelage of Dr. Miles of Ithaca, N. Y. Following an apprenticeship of about two years, and after practicing for two years in Albion, N. Y., he removed to Buffalo, where he practiced for thirty-two years. He afterward removed to New York, and finally to Onset, Mass.

The deceased was a man of unusual skill and manipulative ability. While in Buffalo he devised a form of vulcanizer operated by

gas, those in use at that time being cumbersome and scarcely fit for the purpose for which they were being employed. Dr. Brown also invented and improved a number of dental instruments.

He was married in 1843 to Miss Fanny C. Swan of Albion, N. Y. He is survived by three children.

DR. EDGAR DENMAN SWAIN.

DIED, April 28, 1904, at his home in Batavia, Ill., from apoplexy, EDGAR DENMAN SWAIN, D.D.S.

Dr. Swain was born in Vermont, August 14, 1836. He studied dentistry under Dr. Carpenter of Saratoga Springs, and in 1859 moved to Batavia, Ill. He went to the war in 1861, having organized a company, and took an active part in several notable engagements. He was mustered out in 1866. After the war he became actively connected with the National Guard of Illinois, and was for several years colonel of the First Regiment, stationed at Chicago.

Dr. Swain was prominently identified with the Chicago Dental Society and the Illinois State Dental Society for over thirty years. He took an active part in the deliberations of these bodies, in which he filled many offices of responsibility and honor. He was one of the organizers of the present Northwestern University Dental School and was the executive officer of its faculty for a number of years. Several years ago the ill state of his health forced him to give up practice. He then engaged in outdoor work, and after a time, having apparently regained his health, resumed active practice. His death was entirely unexpected and has plunged into deep grief a host of friends and admirers—to whom the memory of his well-spent, good, and useful life may perhaps serve to mitigate slightly the sorrow caused by his demise.

The Chicago Dental Society passed the following resolution of regret on the loss of their fellow member:

THE Chicago Dental Society, now in session, offers this expression of our grief at the sudden death of Dr. Edgar D. Swain:

Whereas, For more than thirty years he was one of the group of honored and trusted men who conducted the affairs of this society and of the State Society. He performed every service and received every honor that those societies could ask or confer upon him, and

his name was seldom absent from the list of officers or important committees.

His strong, sincere, and positive nature won for him, far more than is usual, the respect and honor of all who knew him and the warm affection of those who were nearest to him. These qualities and a generous disposition made him especially a friend and helper of worthy young men. No one ever heard him speak a harsh or unkind word for anyone, unless for some act of meanness or sordidness.

This society, the State Society, and the dental profession of Illinois owe him a large debt of gratitude, and his memory will long be cherished among us. Those who knew him well will never cease to miss his presence and to mourn his loss.

RESOLVED, That the above be placed upon the records of this society, and that copies be sent to his family and to the dental journals.

EDMUND NOYES,
J. G. REID,
GEO. J. DENNIS,
Committee.

DR. LEOPOLD NEUMANN.

DIED, at San Francisco, March 27, 1904, LEOPOLD NEUMANN, in his forty-seventh year.

Dr. Neumann was born in Berlin, Germany, in 1857. He began the study of dentistry with Dr. L. Bush of San Francisco in 1875, and after attending the regular course of instruction at the Pennsylvania College of Dental Surgery in Philadelphia, he graduated from that institution February 28, 1878. Returning at once to San Francisco, he began the practice of his profession in that city and soon secured a lucrative following.

About three years ago Dr. Neumann inherited a large fortune from his brother, the late Rudolph Neumann, manager of the Alaska Commercial Company, whose death occurred in consequence of a fall down the shaft in the Apollo mine. Dr. Neumann retired from the practice of his profession and went abroad for a time.

He was genial and affable in his social relations, a popular club man, and a successful dentist. He was a member of the California State Dental Society, and of the San Francisco Verein, in the club-house of which organization the funeral services were held. His remains were cremated at the Odd Fellows Cemetery, San Francisco. Dr. Neumann was unmarried.



The Coliseum Building, St. Louis,

WHERE THE FOURTH INTERNATIONAL DENTAL CONGRESS WILL BE HELD.

Fourth International Dental Congress.

GENERAL INFORMATION.

THE Fourth International Dental Congress to be held in St. Louis, August 29th to September 3d, inclusive, 1904, will convene in the Coliseum, a building most favorably adapted to the holding of such a gathering and possessing accommodations so ample that all of the features of the Congress will be held under one roof and without interference one with another. This great structure occupies two blocks between Olive and St. Charles, and Thirteenth and Fourteenth sts.; it covers an area of nearly four acres, with a floor space for exposition purposes of 300,000 square feet.

The Coliseum is one of the largest and most commodious convention halls ever built, and is practically fireproof. It contains a large theater capable of seating 2500 people, which will be used for the general sessions of the Congress, and ten additional meeting-rooms, furnishing ample accommodations for the simultaneous meeting of the ten sectional divisions of the Congress; a large hall for exhibits, covering 9000 square feet of floor space, practically all of which has been taken by intending exhibitors; and a well-lighted gallery for clinics, capable of accommodating the one hundred chairs which have been provided for that purpose. In addition to the foregoing, numerous committee-rooms and telegraph, telephone, and postal facilities will be provided in the building, and it is expected also that a well-ordered café will be in operation during the time of the Congress.

In connection with the building, and under the same roof, is the Coliseum proper, where 19,000 persons may be comfortably seated, exclusive of the stage, and it is anticipated that this audience-room will be used for one of the social features of the Congress, constituting an entertainment unique of its kind.

Besides the advantages of its ample accommodations for the Dental Congress, the Coliseum building has the advantage of being located in the heart of the business section of St. Louis, and at considerable distance from the Exposition, so that the meetings will be less disturbed by the diverting attractions of the great Exposition than if the Congress were held within the Exposition grounds.

Accommodations.

The Local Committee of Arrangements has selected the Hotel Jefferson as the general headquarters of the Dental Congress. This is one of the most fashionable and complete hotels in the United States, and is located on Twelfth st., one block from the Coliseum. In addition to the Hotel Jefferson as headquarters, the hotel accommodations of St. Louis will be sufficient to meet all requirements. The Information Bureau of the Exposition has a list of ninety-seven well-established hotels in St. Louis with a capacity of 41,000 guests at prices ranging from fifty cents a day upward on the European plan, and from one dollar a day upward on the Amer-

ican plan. These established hotels have been supplemented during the year 1903 by thirty-five new permanent hotels, increasing the permanent hotel capacity to 67,000 guests, at prices ranging from one dollar a day upward. The Exposition management holds the signed agreement of the leading hotels that "rates shall not be increased during the World's Fair period." Prices are now lower in St. Louis than in any other city for similar hotel accommodations and service.

The Exposition Information Bureau's list of 132 permanent hotels includes only those of the better class. There are now 173 hotels, large and small, in operation in the city, and the new hotel enterprises being inaugurated justify the belief that the number will reach 250.

Besides hotels with accommodations for more than 200,000 guests, the Exposition Information Bureau has a list of boarding-houses and rooming-houses of a respectable character on the street-car lines with lodgings for 65,000 guests, and a list of private houses that will let rooms for 20,000 persons. All over the city permanent houses and rooming-houses are available to those who prefer rooms away from the crowds, with meals at the restaurants. There are 485 restaurants in St. Louis that have a national reputation for good fare, good service, cleanliness, and moderate prices; twenty of these 485 restaurants can take care of 40,000 patrons.

St. Louis and Its Surroundings.

The climate of St. Louis is temperate in summer and most delightful in the spring and autumn. The weather which visitors to the Louisiana Purchase Exposition may expect is shown by the "normals" at St. Louis, taken from the records of the United States Weather Bureau. These "normals" are the averages of the temperatures at St. Louis during the thirty-three years that the

Weather Bureau has had a station in St. Louis. The "normals" are as follows: May, 66.1; June, 75.4; July, 79.4; August, 77.6; September, 70.2; October, 58.7; November, 44.3. How closely the actual temperature for any one year follows the normal is well shown by the mean temperature for the month taken by the Weather Bureau at St. Louis during the past year. These temperatures are: May, 71.8; June, 74.2; July, 80.3; August, 76.4; September, 66.4; October, 62.2; November, 63.3. The weather at St. Louis during October and November is particularly pleasant. It is the "Indian summer" of the middle states.

St. Louis is the most central and most accessible of the four large cities of the United States. Twenty-seven railways enter it, besides passenger steamers on the Mississippi reaching it from the north and south.

World's Fair cheap rates on railways and steamboats will be offered during the whole Exposition season as follows: Season tickets for eighty per cent. of double one fare, good to return until December 15th. For sixty days, one and one-third fare, not good to return after December 15th. For ten days, one fare plus two dollars, from points within 250 miles of St. Louis. For fifteen days, one fare plus two dollars, from points over 250 miles from St. Louis.

St. Louis is the fourth city of the United States in point of population, having 750,000 people. It presents peculiar attractions for the student of nature, science, history, etc. There are twenty-four public parks, containing over 2100 acres of well-improved property. The World's Fair grounds lie five miles from the Mississippi river on the eastern border of the state, and are reached quickly and comfortably by steam railways and electric lines. Visitors reach the city through one of the largest railway stations in the world; thirty-two tracks enter the station side by side. Most of the hotels, except those in the

World's Fair grounds, are within ten minutes' ride of the station, which is in the heart of the business district. Street cars reaching all of the hotels for a single five-cent fare pass the station, and the cab, carriage, and baggage system is excellent.

Nearly every member of the Fourth International Dental Congress will wish to see the World's Fair. The Local Committee of Arrangements has already planned a special "Congress day" at the Exposition, and ample opportunity will be provided for members to enjoy visiting this greatest of all expositions. Congressman Baltholdt in a recent speech made before the Congress of the United States, among other things, said: "All in all, the Universal Exposition of 1904 will be the sensational climax of the twentieth century, the grandest victory of peace and civilization, the greatest triumph human genius has yet achieved. To millions of its visitors it will be an academy of learning, an inspiration and an inexhaustible source of genuine delight, and the memories of the 'Ivory City' will live and bear fruit in the ages yet to come."

Visitors From Abroad.

Extensive preparation is being made for the hospitable care and entertainment of all members attending the Dental Congress. The General Committee of Reception, aided by the local committees, is making every effort to provide for the comfort and care of all visitors. Dr. D. O. M. LeCron, Missouri Trust Building, St. Louis, chairman of the Permanent Local Committee and Bureau of Information, will be pleased to answer all inquiries regarding the accommodations for those who desire to secure them in advance of the Congress. A subcommittee of the General Reception Committee has been appointed to meet and give information and direction to those arriving from Europe and elsewhere at

the principal ports of entry of the United States, and to arrange the details of transportation from the seaboard to St. Louis. These committeemen will answer inquiries as to hotels, railways, etc. The subcommittees of the General Reception Committee for the principal ports of entry are—

New York—Drs. W. C. Deane, 114 E. 60th st., and Gladstone Goode, 35 W. 46th st.

Philadelphia—Drs. J. D. Thomas, 1122 Walnut st., Joseph Head, 1500 Locust st., and Julio Endelman, S. E. cor. Twelfth and Chestnut sts.

San Francisco—Drs. H. P. Carlton, 62 Crocker Bldg., and P. D. Gaskill, Crocker Bldg.

New Orleans—Drs. J. J. Sarrazin, Godchaux Bldg., and R. H. Welch, Godchaux Bldg.

Baltimore—Drs. Cyrus M. Gingrich, 608 St. Paul st., W. G. Foster, 813 N. Eutaw st., and B. Holly Smith, 1007 Madison ave.

In other cities not ports of entry but which may be visited by members from abroad, the following committeemen will furnish all desired information:

Buffalo—Drs. F. E. Howard, 331 Franklin st., C. W. Stainton, 47 N. Pearl st., S. Eschelman, 421 Franklin st.

Chicago—Drs. T. L. Gilmer, 31 Washington st., J. W. Wassall, 92 State st., W. V-B. Ames, 34 Washington st.

St. Louis—Dr. Wm. Conrad, 3666 Olive st. (chairman Local Committee of Reception and Arrangements).

Washington—Drs. H. C. Thompson, 1113 Pennsylvania ave., N. W., W. E. Dieffenderfer, 616 Twelfth st., Wms. Donnelly, 1118 Fourteenth st., N. W., and W. N. Cogan, "The Sherman."

The following itinerary has been arranged for delegates from abroad desiring to make the trip from New York to St. Louis and return:

Arriving at New York, an opportunity will be offered to all who may desire to visit that Metropolis of America. Leaving New York on the N. Y. Central and Hudson River Railway by special train, Pullman coaches and dining car—if there should be one hundred and fifty or more in the party, otherwise by regular trains—at about 9 A.M., making a daylight run along the beautiful Hudson

River, the Rhine of America, with the Palisades, West Point Military Academy (said by Prince Henry to be the finest military school in the world) and the famous Catskills, on the west bank; with Peekskill, Garrison, Rhinecliff, Poughkeepsie, and Hudson, thence to Albany, the capital of the Empire State, on the east—a distance of about one hundred and forty-four miles of probably the most enchanting and varied railway scenery to be found in the world. From Albany along the Mohawk river, through the Mohawk valley, one of the most picturesque and charming to be found in America, and replete with historic incidents; thence passing through Schenectady, Little Falls, Utica, Rome, and Syracuse, the great salt-manufacturing city of the world. From Syracuse the route skirts the Erie Canal (upon which the state of New York is now expending in the neighborhood of \$100,000,000 on enlargements), passing through Lyons, Newark, and Palmyra, prosperous cities of from fifteen to twenty thousand population each, thence to Rochester, one of the most important inland cities in the country, but interesting chiefly because of the Genesee Falls, the greatest in sheer descent of any on the American continent. From Rochester the route is through a section of the finest fruit belt of the Atlantic coast, passing Byron, Batavia, and Depew, arriving at Buffalo, the great electrical city of the world, about 7 P.M., where the night will be spent at the Hotel Iroquois, one of the great hotels of America. A side trip to be made the following day to the ever-beautiful Niagara Falls, twenty miles away, returning to Buffalo for dinner and lodging at the Hotel Iroquois. Leaving Buffalo at 8 A.M., via the Lake Shore and Michigan Southern Railway, famous for the fastest mail trains in the United States service and also as the route of the "Twentieth Century Limited," running between New York and Chicago in twenty hours; the Lake Shore Limited, in twenty-four hours, and the twenty-six hour trains between Chicago and Boston. It is also the railway which, on October 4, 1895, won the world's record for long-distance speed, making the phenomenal run of 510 $\frac{1}{2}$ miles in 470 minutes, or an average of over sixty-five miles per hour.

This route skirts Lake Erie, passing through Dunkirk, Ashtabula, Cleveland, Toledo, Fort Wayne, and Elkhart, arriving in Chicago at about 9 P.M., where the night and following day will be spent in seeing that most wonderful city. Leaving Chicago at 10 A.M. or 10 P.M., via the Chicago and Alton Railway, whose route for the first thirty miles is along the great Chicago Drainage Canal, a public work surpassing in magnitude and

difficulties the building of the Suez Canal; thence to Joilet and Springfield, the capital of Illinois and the last resting-place of Abraham Lincoln, to Alton, arriving at St. Louis either at 6 P.M. or 7 A.M., depending on whether the time of leaving Chicago is in the morning or evening. At St. Louis the Hotel Jefferson is selected as headquarters for the Congress, with rates from seven to ten dollars per day, with bath, either for one, two, or three in a room, European plan—and reservations should be made not later than August 1st. Those desiring less expensive accommodations can secure them near the place of meeting by applying in advance to Dr. D. O. M. LeCron, Missouri Trust Building, St. Louis, Mo., U.S.A.

Returning, leaving St. Louis by way of the Pennsylvania Railway, the route is through Terre Haute, Indianapolis, Springfield, Columbus, Pittsburg, and Harrisburg, thence to Washington the capital of the United States, where stop-over privileges have been secured for those who may desire to spend a little time in seeing the most beautiful and interesting city in America. From Washington through Baltimore and Philadelphia, where stop-over privileges have also been secured, and thence to New York.

The rate for the round trip from New York, exclusive of sleeping-car charge and subsistence, is \$32.35. Arrangements have been made for any who may desire to return from St. Louis via the Big Four, Lake Shore, and Michigan Southern and the New York Central railways to New York.

Those who desire to take advantage of this itinerary should communicate with Dr. Deane or Dr. Goode of the New York Reception Committee, notifying either of them of the date of arrival and by what steamship line.

Membership in the Congress.

The following are the rules governing membership in the Fourth International Dental Congress, submitted by the Committee on Membership and approved by the Committee of Organization:

I. All reputable practitioners of dental and oral surgery who are entitled to membership in representative state, district, or local dental associations where they reside are eligible for membership in the Congress.

II. The state conference committees in America, and the national chairman of each foreign country have authority to receipt for

the membership fee, which, with the application for membership, shall be forwarded to the chairman of the Finance Committee, Dr. C. S. Butler, 680 Main st., Buffalo, N. Y., who will thereupon forward the official credentials conferring membership in the Congress.

III. If any difference of opinion arises in state committees or national committees as to the eligibility of an applicant for membership, the question shall be referred to the Committee on Membership of the Congress.

IV. The wives and children of the members of the Congress may be admitted upon special request and by consent of the Committee on Membership.

V. A uniform fee of ten dollars shall be paid for each membership, and each person whose name appears on the program either as essayist or clinician must be a paid member of the Congress.

J. D. PATTERSON,
Chairman Com. on Membership,
Kansas City, Mo., U. S. A.

Membership in the Congress will entitle the holder to all the privileges of debate and discussion of papers, and the right to vote upon all questions which the Congress will be called upon to decide. It will also entitle the members to participate in all the social functions of the Congress under the same conditions as enjoyed by others; to the official badges and insignia of the Congress; to one copy of the complete volumes of the Transactions, which it is anticipated will comprise not less than four volumes of about five hundred pages each. Judging from the material already offered, it is believed that the Transactions of the Congress will be the most complete exposition of modern dentistry yet published. This work will be sent to every member, whether he is able to be present at the Congress or not.

In order to avoid confusion and crowding of work at the last minute, those intending to apply for membership in the Congress are urged to send in their applications at once, which will give time to correct any error should one by chance occur.

All communications of a scientific nature must be submitted to the Committee on Essays for approval before

final acceptance for a place upon the program. All communications to the literary program of the Congress from foreign countries must receive the approval of the national committee of the respective countries from which they are sent before they can be accepted by the Committee on Essays of the Congress. Each essay must be accompanied by a *résumé* giving the substance of the communication in an epitomized form, which must be in the hands of the Essay Committee thirty days before the opening of the Congress, in order to give opportunity for translation and printing in advance of the Congress, and in order to secure a position upon the official program. All essays, titles of essays, and *résumés* thereof should be forwarded to Dr. Wilbur F. Litch, 1500 Locust st., Philadelphia, Pa., U. S. A., or to the secretary of the Committee of Organization.

Clinics.

All who intend to give clinical demonstrations should communicate with Dr. J. P. Gray, 212 N. Spruce st., Nashville, Tenn., U. S. A., chairman of the Committee on Clinics, who will make the necessary arrangements and supply suitable patients as far as may be possible. The rules governing the approval of literary communications by the several national committees will govern also the clinical demonstrations, and all arrangements for clinical demonstrations must be completed by August 1st in order to secure space and a place upon the program.

Exhibits.

All exhibits of a technical character relating to dentistry will be arranged for by the chairman of the Committee on Exhibits, Dr. D. M. Gallie, 100 State st., Chicago, Ill., U. S. A., to whom all applications should be made for space. All exhibits relating to dental education will be provided for upon application to Dr. Truman W. Brophy, Marshall Field Building, Chicago, Ill., U. S. A., chair-

man of Section IX—Education, Nomenclature, Literature, and History.

Prizes.

The Committee of Organization offers two prizes, viz., a handsome gold medal for the best essay on any subject pertaining to dentistry, and a similar medal for the best exhibit of an archæological character illustrating the development of dental art. All essays in competition for the gold medal prize are to be forwarded to Dr. James Truman, 4505 Chester ave., Philadelphia, Pa., U. S. A., chairman of the Committee on Prize Essays, without the name of the author attached, and designated by a motto, accompanied by a sealed envelope containing the name of the author and bearing upon its outside a duplicate of the motto upon the essay. The committee after having decided upon the respective merits of the essays and after having selected that one deemed worthy of the medal, will open the envelope bearing the duplicate motto and announce the name of the successful author. The other communications will be destroyed *incognito* six months after the Congress closes unless return of the unsuccessful essays be requested by the authors thereof within that period; or, at the option of the writers, the competing essays which fail to secure the medal may be referred to the Essay Committee for presentation before the Congress. The successful prize essay will be published as a part of the proceedings of the Congress.

The awarding of the prize for the archæological exhibit will be made by a committee to be appointed specially for that purpose. All exhibits competing for this medal will be cared for by the chairman of the Committee on Exhibits, Dr. D. M. Gallie, 100 State st., Chicago, Ill., U. S. A.

Medal.

The Committee of Organization has authorized the striking of a bronze medal commemorative of the Fourth Interna-

tional Congress. This handsome souvenir should be in the possession of every member of the Congress, as it is not only a beautiful work of art and intrinsically valuable as such, but it will be a memento of the greatest Congress of dentists ever held. The illustration is a half-tone reproduction of the artist's sketch and is worthy of careful study.



The figure upon the obverse side—that of St. Apollonia, which has been selected to typify dentistry—is one which not only serves the symbolic end, but one which lends itself particularly well to artistic treatment. The original design from which the illustration is reproduced is an artistic representation which has both merit and beauty. The symbolism of the reverse of the medal has been given ample consideration, and it is such as should meet with general approval. The universality and international character of the Congress movement is typified by the continental divisions of the world. The associated dates at the top of the design are those which embrace the professional life-history of dentistry. Falling gracefully down be-

tween the continents is a scroll upon which is to be inscribed the names of the recognized fathers of dentistry in all countries, each national body being asked to nominate the name or names to represent the respective countries. The pose of the eagle represents the auspices under which the Congress is to be held, and the palm branch a tribute of honor on behalf of the American profession to the fathers of dentistry.

The execution of the dies has been entrusted to the most expert die-sinker in America. The design is in high relief, and the medal will be struck in bronze, and will be about two and one-half inches in diameter. It will be a finished work of art in all respects, and an attractive and interesting souvenir of the great meeting which it typifies.

The medal will be supplied only to those who make application for it in advance of the Congress, as the number struck will be limited to the number subscribed for. The price of the medal without a case has been fixed at five dollars. Cases for the medal will be furnished at prices corresponding with their character and quality.

Those who desire to secure one of these souvenir medals will forward the amount of the subscription to Dr. Chas. S. Butler, chairman of the Finance Committee, 680 Main st., Buffalo, and the medal will be sent before the opening of the Congress. No medals will be available beyond the number subscribed for in advance of the Congress.

Present State of Organization.

The chairman of the Committee of Organization through Senator Depew has secured from Secretary of State the Hon. John Hay a promise to send through our foreign ambassadors and representatives an invitation on behalf of our government to all governments with which the United States is in diplomatic relation to send an official delegate to the Congress, and the Secretary has received notification that these invitations have been issued.

Upward of twenty nations have signified their intention to take part in this great Congress. No fewer than fifteen hundred committeemen are now actively at work promoting the success of the meeting. Every state and territory in the United States is in charge of a state committee actively at work in developing the details of the Congress in a local way. So that the prospect of an unusually large attendance is practically assured, and it is confidently expected that the membership in the Fourth International Dental Congress will be much in excess of any other dental meeting ever held. The number and character of essays already prepared, the number and character of the clinical demonstrations, the magnitude of the exhibits already arranged for, will surpass in these features all previous dental meetings. The work which has been accomplished by the Committee on Education, Legislation, and Dental History will constitute the most extensive contributions to these departments yet made.

The social features of the Congress are being provided for upon an elaborate plan. Receptions, luncheons, and various forms of entertainment are being arranged on a scale commensurate with the magnitude and importance of the meeting, and as much time will be given to the amenities of social intercourse as may be consistent with the more serious features of the program.

The Fourth International Dental Congress is now an assured success, and, judged from any standpoint, it will be a meeting which will not only adequately set forth the most recent developments of dental science and art, but it will constitute a liberal education in dentistry which no progressive practitioner can afford to miss.

An efficient corps of interpreters has been provided to assist those visiting members who are unfamiliar with the English language.

EDWARD C. KIRK, *Secretary*
Committee of Organization.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization of the Congress.

H. J. BURKHART, Chairman,
Batavia, N. Y.

E. C. KIRK, Secretary,
Lock Box 1615, Philadelphia, Pa.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer, 1420 Chestnut st., Philadelphia, Pa.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen, 1005 Sutter st., San Francisco, Cal.
- IV. Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.
- VI. Orthodontia. Chairman, E. H. Angle, 1023 N. Grand ave., St. Louis, Mo.
- VII. Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.
- VIII. Prosthesis. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.
- IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy, Marshall Field Bldg., Chicago, Ill.
- X. Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Committees.

Following are the committees appointed:

Finance. Chairman, C. S. Butler, 680 Main st., Buffalo, N. Y.

Program. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Exhibits. Chairman, D. M. Gallie, 100 State st., Chicago, Ill.

Transportation. (To be appointed.)

Reception. Chairman, B. Holly Smith, 1007 Madison ave., Baltimore, Md.

Registration. Chairman, B. L. Thorpe, 3666 Olive st., St. Louis, Mo.

Printing and Publication. Chairman, W. E. Boardman, 184 Boylston st., Boston, Mass.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey, 524 Penn ave., Pittsburg, Pa.

Dental Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel, 527½ Church st., Nashville, Tenn.

Membership. Chairman, J. D. Patterson, Keith and Perry Bldg., Kansas City, Mo.

Educational Methods. Chairman, T. W. Brophy, Marshall Field Bldg., Chicago, Ill.

Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

Prosthetic Dentistry. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.

Local Committee of Arrangements and Reception. Chairman, Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Essays. Chairman, Wilbur F. Litch, 1500 Locust st., Philadelphia, Pa.

History of Dentistry. Chairman, Wm. H. Trueman, 900 Spruce st., Philadelphia, Pa.

Nomenclature. Chairman, A. H. Thompson, 720 Kansas ave., Topeka, Kans.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally, 1018 14th st., N. W., Washington, D. C.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown, 175 Newbury st., Boston, Mass.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.

Prize Essays. Chairman, James Truman, 4505 Chester ave., Philadelphia, Pa.

Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.

Resolutions. Chairman, J. Y. Crawford, Jackson Bldg., Nashville, Tenn.

Clinics. Chairman, J. P. Gray, 212 N. Spruce st., Nashville, Tenn.

Nominations. Chairman, A. H. Peck, 92 State st., Chicago, Ill. W. E. Boardman, 184 Boylston st., Boston, Mass. M. R. Windhorst, 3518 Morgan st., St. Louis, Mo. Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Ad Interim. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

The officers of the Congress, honorary presidents, president, active vice-presidents, secretary-general, assistant secretaries and a treasurer will be nominated by the Nominating Committee—composed of two members of the Committee of Organization and two members of the Federation (F. D. I.) Committee, in accordance with instructions from the Director of Congresses, Hon. Howard J. Rogers.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be

held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.
DAVID R. FRANCIS, *President of Exposition*.

Fourth International Dental Congress.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

J. A. LIBBEY, *Chairman*,
524 Penn Avenue, Pittsburg, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing membership as prescribed by the Committee on Membership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of*

dentistry. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state chairman, whose indorsement is a certification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the committee earnestly appeals to each eligible practitioner in the United States who is interested in the success of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are—

General Chairman.

J. A. LIBREY, 524 Penn Ave., Pittsburg, Pa.

Vice-Chairman.

WM. CONRAD, 3666 Olive St., St. Louis, Mo.

State Chairmen.

Alabama. H. CLAY HASSELL, Tuscaloosa.
 Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.
 California. J. L. PEASE, Central Bank Bldg., Oakland.
 Colorado. H. A. FENN, 500 California Bldg., Denver.
 Connecticut. HENRY McMANUS, 80 Pratt St., Hartford.
 Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.
 District of Columbia. W. N. COGAN, The Sherman, Washington.
 Florida. W. G. MASON, Tampa.
 Georgia. H. H. JOHNSON, Macon.
 Hawaii. M. E. GROSSMAN, Box 744, Honolulu.
 Idaho. J. B. BURNS, Payette.
 Illinois. J. E. HINKINS, 131 E. 53d St., Chicago.
 Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.
 Iowa. W. R. CLACK, Clear Lake.
 Kansas. G. A. ESTERLY, Lawrence.
 Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.
 Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.
 Maine. H. A. KELLEY, 609 Congress St., Portland.
 Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.
 Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.
 Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.
 Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.
 Mississippi. W. R. WRIGHT, Jackson.
 Missouri. J. W. HULL, Altman Bldg., Kansas City.
 Montana. G. E. LONGEWAY, Great Falls.
 Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.
 New Hampshire. E. C. BLAISDELL, Portsmouth.
 New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.
 New York. B. C. NASH, 142 W. 78th St., New York City.
 N. Carolina. C. L. ALEXANDER, Charlotte.
 N. Dakota. ALBERT HALLENBURG, Fargo.
 Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.

Oklahoma. T. P. BRINGHURST, Shawnee.
 Oregon. S. J. BARBER, Macleay Bldg., Portland.
 Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.
 Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.
 South Carolina. J. T. CALVERT, Spartanburg.
 South Dakota. E. S. O'NEIL, Canton.
 Tennessee. W. P. SIMS, Jackson Bldg., Nashville.
 Texas. J. G. FIFE, Dallas.
 Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.
 Vermont. S. D. HODGE, Burlington.
 Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.
 Washington. G. W. STRYKER, Everett.
 West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.
 Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.

For the Committee of Organization,

EDWARD C. KIRK, *Secretary*.

Fourth International Dental Congress.

MEETING OF THE COMMITTEE OF ORGANIZATION.

At a meeting of the Committee of Organization of the Fourth International Dental Congress held in St. Louis, Mo., April 9, 1904, the following action was taken:

In accordance with the understanding at the last meeting of the committee, held at Washington, D. C., February 23, 1904, that a Nominating Committee for the purpose of nominating officers for the Fourth International Dental Congress be elected at the next meeting of the committee,

Dr. M. F. Finley made the following motion:

"That a Committee on Nominations be elected at this time for the purpose of proposing names for the officers of this Congress, and that Drs. A. H. Peck and W. E. Boardman, representing the Committee of the National Dental Association, and Drs. M. R. Windhorst and Wm. Conrad, representing the Committee of the *Fédération Dentaire Internationale*, be constituted the Committee on Nominations, to present nominations for the officers of the Fourth Inter-

national Dental Congress, and that said nominations be presented at the present meeting of the Committee of Organization."

The motion was unanimously carried, and Drs. A. H. Peck, W. E. Boardman, M. R. Windhorst, and Wm. Conrad were elected as the Nominating Committee.

At a subsequent session the Nominating Committee presented the following report:

"Your committee begs to report the following nominations for officers of the Fourth International Dental Congress:

"President—H. J. Burkhardt, Batavia, N. Y.

"Honorary Presidents—James Truman, Philadelphia, Pa. A. H. Fuller, St. Louis, Mo. G. V. Black, Chicago, Ill. Thomas Fillebrown, Boston, Mass. S. G. Perry, New York, N. Y. Gordon White, Nashville, Tenn. E. T. Darby, Philadelphia, Pa. James McManus, Hartford, Conn. G. A. Bowman, St. Louis, Mo. H. A. Smith, Cincinnati, O. T. W. Brophy, Chicago, Ill. Wm. Jarvie, Brooklyn, N. Y. Wm. Conrad, St. Louis, Mo. M. R. Windhorst, St. Louis, Mo. S. H. Guilford, Philadelphia, Pa. J. D. Patterson, Kansas City, Mo. C. C. Chittenden, Madison, Wis. Wm. Carr, New York, N. Y. E. H. Smith, Boston, Mass. M. H. Cryer, Philadelphia, Pa. E. A. Bogue, New York, N. Y. V. E. Turner, Raleigh, N. C. A. L. Northrop, New York, N. Y. S. A. Freeman, Buffalo, N. Y. Wm. Crenshaw, Atlanta, Ga. J. W. David, Corsicana, Texas. J. Hall Moore, Richmond, Va. C. Newlin Peirce, Philadelphia, Pa.

"Vice-Presidents—A. H. Thompson, Topeka, Kans. J. G. Reid, Chicago, Ill. George Fields, Detroit, Mich. Garrett Newkirk, Los Angeles, Cal. R. Ottolengui, New York, N. Y. R. M. Sanger, East Orange, N. J. D. N. Rust, Washington, D. C. N. S. Hoff, Ann Arbor, Mich. L. P. Bethel, Columbus, O. Jules J. Sarrazin, New Orleans, La. Chas. L. Alexander, Charlotte, N. C. C. H. Darby, St. Joseph, Mo. B. C. Nash, New York, N. Y. G. S. Vann, Gadsden, Ala. B. F. Luckey, Paterson, N. J. E. R. Warner, Denver, Colo. Wms. Donnally, Washington, D. C. Frank Holland, Atlanta, Ga. W. P. Dickinson, Minneapolis, Minn. E. K. Wedelstaedt, St. Paul, Minn. Adam Flickinger, St. Louis, Mo. V. H. Jackson, New York, N. Y. J. M. Whitney, Honolulu, Hawaii. B. Holly Smith, Baltimore, Md. Louis Ottofy, Manila, P. I. Cyrus M. Gingrich, Baltimore, Md. H. B. Tileston, Louisville, Ky. J. F. Dowsley, Boston, Mass. Geo. E. Hunt, Indianapolis, Ind. M. S. Merchant, Giddings, Tex.

"Secretary-General—Edward C. Kirk, Philadelphia, Pa.

*"Treasurer—*M. F. Finley, Washington, D. C.

*"Committee to Nominate Honorary Presidents and Vice-Presidents for Foreign Countries—*Edward C. Kirk, Philadelphia, Pa. Edward H. Angle, St. Louis, Mo. Wilbur F. Litch, Philadelphia, Pa.

(Signed)

"A. H. PECK,

"WALDO E. BOARDMAN,

"WM. CONRAD,

"M. R. WINDHORST,

"Committee on Nominations."

The above report was unanimously adopted.

It should be understood that the foregoing list of nominations is necessarily incomplete and subject to future correction and amendment, depending upon individual acceptances and the addition of new names. In its present form it represents the list of nominations corrected up to the date of this issue.

EDWARD C. KIRK, *Secretary*
Committee of Organization.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

June, July, and August 1904.

JUNE.

AMERICAN MEDICAL ASSOCIATION: SECTION ON STOMATOLOGY. Atlantic City. Four days: June 7th to 10th.

BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION. Boston. June 14th.

GEORGIA STATE DENTAL SOCIETY. Athens. Three days: June 28th to 30th.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: June 14th to 16th.

MASSACHUSETTS DENTAL SOCIETY. Boston. Two days: June 1st and 2d.

MINNESOTA STATE DENTAL ASSOCIATION. St. Paul. Three days: June 16th to 18th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. Washington, D. C. June 9th.

NORTH CAROLINA STATE DENTAL SOCIETY. Morehead City. Four days: June 29th to July 2d.

NORTHERN OHIO DENTAL ASSOCIATION. Cleveland. Three days: June 7th to 9th.

SOUTHERN WISCONSIN DENTAL ASSOCIATION. Janesville. Two days: June 8th and 9th.

JULY.

MAINE DENTAL SOCIETY. Bangor. Three days: July 19th to 21st.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 20th to 22d.

NORTHERN IOWA DENTAL SOCIETY. Waterloo. Three days: July 26th to 28th.

PENNSYLVANIA STATE DENTAL SOCIETY. Wilkesbarre. Three days: July 12th to 14th.

RED RIVER VALLEY DENTAL SOCIETY. Grand Forks, N. D. July 4th.

SOUTH CAROLINA STATE DENTAL SOCIETY. White Stone Lithia Springs. Four days: July 19th to 22d.

WISCONSIN STATE DENTAL SOCIETY. Manitowoc. Three days: July 19th to 21st.

AUGUST.

FOURTH INTERNATIONAL DENTAL CONGRESS. St. Louis, Mo. Six days: August 29th to September 3d.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. St. Louis. Three days: August 25th to 27th.

State Board Meetings.

CALIFORNIA BOARD OF DENTAL EXAMINERS. Los Angeles. June 13th.

COLORADO BOARD OF DENTAL EXAMINERS. Denver. June 7th to 9th.

DENTAL COMMISSIONERS OF CONNECTICUT. Hartford. July 14th to 16th.

MASSACHUSETTS BOARD OF REGISTRATION. Boston. June 22d to 24th.

MINNESOTA BOARD OF DENTAL EXAMINERS. Minneapolis. June 13th to 15th.

MONTANA BOARD OF DENTAL EXAMINERS. Helena. June 6th, 7th, and 8th.

NEW HAMPSHIRE BOARD OF REGISTRATION. Manchester. June 14th and 15th.

NEW JERSEY BOARD OF REGISTRATION AND

EXAMINATION IN DENTISTRY. Trenton. July 5th to 7th.

NORTH CAROLINA BOARD OF DENTAL EXAMINERS. Morehead City. June 27th to 29th.

OHIO BOARD OF DENTAL EXAMINERS. Columbus. June 28th to 30th.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS. Philadelphia and Pittsburg. June 8th to 11th.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS. White Stone Lithia Springs. July 15th.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS. Aberdeen. June 9th.

VERMONT BOARD OF DENTAL EXAMINERS. Montpelier. July 5th.

VIRGINIA BOARD OF DENTAL EXAMINERS. Richmond. June 14th.

WEST VIRGINIA BOARD OF DENTAL EXAMINERS. Wheeling. June 1st to 3d.

WISCONSIN BOARD OF DENTAL EXAMINERS. Milwaukee. June 1st.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY.

FOLLOWING is the program of the Section on Stomatology, American Medical Association, meeting at Atlantic City, June 7 to 10, 1904:

1. Dental Education: (a) "The Value of Symmetry in the Development of Professional Character and Education" (chairman's address). Geo. F. Eames, Boston, Mass. (b) "The Evolution of Standards in Dental Education," Chas. Chittenden, Madison, Wis. (c) "Phases of Dental Education," A. E. Baldwin, Chicago, Ill. (d) "Dental Education (A Retrospective and Prospective View)," John S. Marshall, San Francisco, Cal.

2. The Dental Pulp: (a) "Neoplasm of the Tooth-pulp," Vida A. Latham, Chicago, Ill. (b) "Vital Principles in Adult Pulp," R. R. Andrews, Cambridge, Mass. (c) "Degeneration of the Tooth-pulp," Eugene S. Talbot, Chicago, Ill. (d) "The Pulp," Jos. Arkövy, Budapest, Hungary.

3. "A System for Surgical Treatment of Hare-lip, Cleft Palate, and Facial Deformities, and Post-Operative Speech Education," Geo. V. I. Brown, Milwaukee, Wis.

4. "Multiple Fracture of Lower Jaw com-

plicated by Simultaneous Fracture of the Upper Jaw," Thos. L. Gilmer, Chicago, Ill.

5. "Impacted Teeth: Their Diagnosis, Liberation, and Extraction," M. H. Cryer, Philadelphia, Pa.

6. "Ankylosis of the Jaw," G. Lenox Curtis, New York city, N. Y.

7. "Necrosis of the Bones of the Face," Stewart L. McCurdy, Pittsburg, Pa.

8. "Treatment of Pathological Irregularities of the Teeth," M. H. Fletcher, Cincinnati, Ohio.

9. "Report of a Case of Vincent's Angina and Stomatitis, with Photographs," Geo. C. Crandall, St. Louis, Mo.

10. "Oral Infection and Sterilization," M. L. Rhein, New York city, N. Y.

11. "Concerning Changes in the Salivary Secretions as Affected by Systemic Disease," Heinrich Stern, New York city, N. Y., and Wm. Lederer, New York city, N. Y.

12. "Prophylaxis in Relation to Tooth-Environment and to the Prophylactic Value of Materials Employed," Chas. F. Allan, Newburgh, N. Y.

13. "The Physician's Duty to the Child from a Dental Standpoint," Alice M. Steeves, Boston, Mass.

14. "Ethics," Adelbert H. Peck, Chicago, Ill.

Geo. F. EAMES, Boston, *Chairman*,
EUGENE S. TALBOT, Chicago, *Sec'y*.

MASSACHUSETTS DENTAL SOCIETY.

THE fortieth annual meeting of the Massachusetts Dental Society will be held in the Massachusetts Charitable Mechanic Association Building, Huntington ave., Boston, Mass., June 1 and 2, 1904.

EDGAR O. KINSMAN, *Sec'y*,
15 Brattle Sq., Cambridge, Mass.

NORTHERN OHIO DENTAL ASSOCIATION.

THE forty-fifth annual meeting of the Northern Ohio Dental Association will be held at the Western Reserve University Dental College, Cleveland, Tuesday, Wednesday and Thursday, June 7, 8, and 9, 1904. The program is a strong one, and will be of exceptional interest to the general profession.

The motto for the year is the "Annihilation of Pain in Dentistry." Essayists and clinicians have been selected with this thought ever foremost. The best authorities and the most successful men in this line of work will be at this meeting. The members of the profession are cordially invited to attend. It is expected that we will have the largest attendance of any meeting ever held in this section of the country. You cannot afford to miss it. Come!

W. G. EBERSOLE, *Cor. Sec'y*, Cleveland, O.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

CHANGE IN PLACE OF MEETING.

THE Southern Wisconsin Dental Association will meet in Janesville, Wis., June 8 and 9, 1904. Our executive committee and master of clinics promise us the best meeting we have ever had. You will surely be on hand if you know what that means. If you are not a regular attendant, come and join us. We want your assistance, and you can't afford to get along without belonging to the Southern Wisconsin Dental Association.

C. W. COLLVER, *Sec'y*, Clinton, Wis.

INDIANA DENTAL ASSOCIATION.

THE Indiana Dental Association will meet in Indianapolis, Ind., June 14, 15, and 16, 1904. A fine meeting is expected.

A. T. WHITE, *Sec'y*, New Castle, Ind.

BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION.

THIRTY-SECOND ANNUAL CELEBRATION.

"ALUMNI day" will be observed by the Boston and Tufts Dental Alumni Association on Tuesday, June 14, 1904. The morning will be given up to clinics, exercises, and a social reunion at the school building, 416-430 Huntington ave., Boston. In the afternoon there will be an outing and banquet at the Point Shirley Club, by the sea.

Graduates and friends of the school are cordially invited.

MARION L. WOODWARD, *Sec'y*,
2 Commonwealth ave., Boston, Mass.

MINNESOTA STATE DENTAL ASSOCIATION.

THE twenty-first annual meeting of the Minnesota State Dental Association will be held in St. Paul, Minn., on June 16, 17, and 18, 1904.

Dr. Capon of Philadelphia will read an essay and give a clinic on "Inlays." Other essayists and clinicians have been selected from the best operators in the northwest.

All ethical dentists are invited to attend the meetings. Any further information will be cheerfully furnished by either of the undersigned.

J. O. WELLS, *Ch'man Ex. Com.*,
Masonic Temple, Minneapolis, Minn.,
GEO. S. TODD, *Sec'y*, Lake City, Minn.

GEORGIA STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting of the Georgia State Dental Society will be held in Athens, Ga., June 28, 29, and 30, 1904.

Arrangements are being made to make this the greatest convention ever held in Georgia. All ethical practitioners are cordially invited.

A. M. JACKSON, *President*,
D. H. McNEILL, *Cor. Sec'y*.

NORTH CAROLINA STATE DENTAL SOCIETY.

THE thirtieth annual meeting of the North Carolina State Dental Society will be held at Morehead City, N. C., June 29 to July 2, 1904.

J. S. BETTS, *Sec'y*, Greensboro, N. C.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting of the Pennsylvania State Dental Society will be held at the Hotel Sterling, Wilkesbarre, Pa., on Tuesday, Wednesday, and Thursday, July 12 to 14, 1904.

The convention will be called to order at 10 A.M. on Tuesday.

Every effort is being made to make this the most interesting and useful meeting of our society. The Executive Committee promise a very full program, including among its es-

sayists Drs. B. Holly Smith, Baltimore; M. H. Cryer and Edward C. Kirk, Philadelphia; Gordon White, Nashville, Tenn., and Dr. Anema of the Netherlands. Besides these, a number of prominent clinicians, each demonstrating some specialty of dentistry, have volunteered to give their time and skill for the good of the profession and to help to make the meeting a successful one.

All reputable practitioners of the profession are cordially invited to attend the meeting.

GEORGE W. CUPIT, *Sec'y*,
1420 Chestnut st., Philadelphia, Pa.

WISCONSIN STATE DENTAL SOCIETY.

THE thirty-fourth annual meeting of the Wisconsin State Dental Society will be held in Manitowoc, July 19 to 21, 1904. A cordial invitation is extended to all ethical practitioners to meet with us.

A. G. FEE, *Pres.*,
W. H. MUELLER, *Sec'y*,
Madison, Wis.

MAINE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Maine Dental Society will be held in Bangor, Me., July 19, 20, and 21, 1904.

All ethical dentists are invited to attend, and we especially extend an invitation to natives who are practicing out of the state to make this a "home week." We expect men of national reputation to give clinics and read papers.

Reduced rates will be given on transportation and at hotels.

WILL S. PAYSON, *Ch'man Ex. Com.*,
Castine, Me.

SOUTH CAROLINA STATE DENTAL SOCIETY.

THE thirty-fourth annual meeting of the South Carolina State Dental Society will be held at the White Stone Lithia Springs, White Stone, S. C., July 19, 20, 21, and 22, 1904.

We anticipate a pleasant as well as a profitable meeting, and a cordial invitation is extended to all.

E. J. ETHEREDGE, *Sec'y*, Leesville, S. C.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-fourth annual session of the New Jersey State Dental Society will convene in the Auditorium, Asbury Park, N. J., at 10 A.M., Wednesday, July 20, 1904, and continue in session Thursday and Friday. Asbury Park is one of the great Atlantic coast watering-places contiguous to New York and Philadelphia. The Auditorium will hold three thousand people, and is open on every side.

Fifty clinics will be given by men from north, south, east, and west, most eminent in their profession, and will include the newest advances in all that pertains to operative and mechanical dentistry. The society feels that in the exhibits the latest and largest number of adjuncts to the successful practice of modern dentistry will repay a visit and inspection. Wednesday, July 20th, has been set aside as a special exhibitors' day. To get the full benefit of this, dentists should get to the meeting early. The essays will consist of five already accepted and the best obtainable.

The social to members and visiting friends will be provided for as usual, and on Thursday evening at 10.30 a "smoker" will be provided.

The Columbia Hotel will be the headquarters, with rates from \$2.50 to \$3.00 per day. Those desiring rooms must send in notice by July 1st.

The program as usual will be replete with information.

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

NEW YORK INSTITUTE OF DENTAL TECHNIQUE.

THE New York Institute of Dental Technique held its last meeting of the season Friday evening, May 13, 1904, at the "Chelsea," 222 West 23d st., New York city. The meeting was preceded by the usual informal dinner. Dr. E. A. Bogue was the guest of the evening. His subject was "Amalgam." Dr. Bogue prefaced his demonstration by a lecture which covered many phases of the subject. A general discussion followed.

The plan for a post-graduate series of lectures and demonstrations has met with hearty approval. It is intended to have the

arrangements made so that the program for the meetings of the entire season can be given out in October.

The meetings of the society will be held on the fourth Tuesday of the month, beginning in October.

F. C. BRUSH, *President*,
1183 Broadway, N. Y.
C. M. HOBLITZEL, *Sec'y*,
478 West 145th st., N. Y.

NORTHERN IOWA DENTAL SOCIETY.

THE annual meeting of the Northern Iowa Dental Society will be held at Waterloo, Iowa, July 26, 27, and 28, 1904.

A strong effort is being made to have a meeting as good as the best.

Reduced railroad rates may be secured on these dates from any point in the state.

C. L. TOPLIFF, *Sec'y*, Decorah, Iowa.

CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held in Schiller Hall, Tuesday evening, April 5, 1904, the following officers for 1904-1905 were elected: Thomas L. Gilmer, president; C. N. Thompson, first vice-president; F. V. Yorker, second vice-president; Winthrop Girling, recording secretary; A. E. Morey, corresponding secretary; C. P. Pruyn, treasurer; J. H. Woolley, librarian; J. G. Reid, member of board of directors. Board of Censors—C. N. Johnson, chairman, W. V-B. Ames, A. W. Harlan.

A. E. MOREY, *Cor. Sec'y*,
31 Washington st., Chicago, Ill.

NORTHERN INDIANA DENTAL SOCIETY.

THE sixteenth annual meeting of the Northern Indiana Dental Society will be held in Huntingdon, Ind., on October 4 and 5, 1904.

Arrangements are being made to make this the greatest convention ever held in Northern Indiana. Already some of the best talent in the country has been secured.

OTTO U. KING, *Sec'y*, Huntingdon, Ind.

DELTA SIGMA DELTA FRATERNITY.

MEETING OF THE SUPREME CHAPTER.

THE twentieth annual meeting of the Supreme Chapter, Delta Sigma Delta Fraternity, will be held Wednesday, August 31, 1904, at St. Louis, Mo. George E. Hunt, 131 E. Ohio st., Indianapolis, is chairman of the committee on arrangements.

CANADIAN DENTAL ASSOCIATION.

THERE will be a meeting of the Canadian Dental Association at Toronto, Ont., September 6, 7, and 8, 1904.

W. CECIL TROTTER, *Sec'y*, Toronto, Ont.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE next annual meeting of the National Association of Dental Faculties will convene at 10 A.M., June 9, 1904, in Washington, D. C. The Executive Committee will be in session the afternoon of June 8th, to consider such matters as may be brought before it. Arrangements are being made with the railroads for one and one-third fare on the certificate plan. The hotel as headquarters, together with the railroad rates, will be announced later by circular letters to the colleges.

H. B. TILESTON, *Chairman Ex. Com.*,
S. W. FOSTER, *Sec'y*.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their annual meeting in the Coliseum building, corner Thirteenth and Olive streets, St. Louis, Mo., on the 25th, 26th, and 27th of August, beginning promptly at 10 A.M.

Telephone and telegraph offices in the building. Hotel accommodations will be secured for the members.

Special railroad rates will be secured for the members in the East desiring to attend, trains leaving New York on the morning of the 23d.

CHAS. A. MEEKER, *Sec'y and Treas.*

WEST VIRGINIA BOARD OF DENTAL EXAMINERS.

THE West Virginia State Board of Dental Examiners will hold its spring meeting for examinations June 1, 2, and 3, 1904, at Wheeling, W. Va.

For further information address

H. M. VAN VOORHIS, *Sec'y*,
312 Main st., Morgantown, W. Va.

WISCONSIN BOARD OF DENTAL EXAMINERS.

THE next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates desiring license to practice dentistry in Wisconsin will be held in Milwaukee, at Hotel Pfister, June 1, 1904.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry consecutively for four years or an apprentice to a dentist engaged in the reputable practice of dentistry for five years.

J. J. WRIGHT, *Sec'y*,
1218 Wells Bldg., Milwaukee, Wis.

MONTANA BOARD OF DENTAL EXAMINERS.

THE annual meeting of the Montana Board of Dental Examiners will be held in Helena, Mont., June 6, 7, and 8, 1904. Application blanks may be obtained from the secretary. Applicants must furnish all materials for demonstration.

D. J. WAIT, *Sec'y*, Helena, Mont.

COLORADO BOARD OF DENTAL EXAMINERS.

THE regular semi-annual meeting of the Colorado State Board of Dental Examiners will be held in Denver, June 7, 8, and 9, 1904. The examination will be both theoretical and practical, and applicants for the examination must be prepared to do such practical work as is required. All applications must be filed before June 7th.

M. S. FRASER, *Sec'y*,
407 Mack Bldg., Denver, Colo.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

THE South Dakota State Board of Dental Examiners will hold its next regular session for the examination of applicants for license at Aberdeen, S. D., June 9, 1904, beginning at 1.30 P.M. All applicants will be required to insert at least two gold fillings, and such other work as the board may require. Besides the regular operating instruments, each candidate is required to bring a bridge of not less than four teeth, including one Richmond crown, and one molar shell crown, invested ready for soldering.

Application must be made to the secretary at least one week before examination takes place.

G. W. COLLINS, *Sec'y*, Vermillion, S. D.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, June 8 to 11, 1904.

For papers and further information, applicants for examination must address

HON. C. N. SCHAEFFER, *Sec'y Dental Council*,
Harrisburg, Pa.

MINNESOTA BOARD OF DENTAL EXAMINERS.

THE Minnesota State Board of Dental Examiners will meet for the purpose of examining applicants for license on June 13, 14, and 15, 1904. No application received after 12 M. June 13th.

The meeting will be held at the dental department of the State University, Minneapolis.

C. H. ROBINSON, *Sec'y*,
Wabasha, Minn.

VIRGINIA BOARD OF DENTAL EXAMINERS.

THE annual meeting of the Virginia Board of Dental Examiners will be held at the Medical College of Virginia, Richmond, beginning Tuesday, June 14, 1904, at 10 A.M.

R. H. WALKER, *Sec'y*.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE New Hampshire Board of Registration in Dentistry will hold their annual meeting June 14 and 15, 1904, at New City Hotel, Manchester, N. H., for the purpose of examining applicants for license. Applicants should come prepared with instruments and material to put in one gold and one alloy filling. So far as possible patients will be furnished.

Sessions will begin promptly at 9 A.M.

A. J. SAWYER, *Sec'y*, Manchester, N. H.

MASSACHUSETTS BOARD OF REGISTRATION.

THE next meeting of the Massachusetts Board of Registration in Dentistry for the examination of applicants will be held in Boston, on June 22, 23, and 24, 1904.

Application blanks and all necessary information furnished by the secretary.

G. E. MITCHELL, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

NORTH CAROLINA EXAMINING BOARD.

THE Board of Dental Examiners of North Carolina will meet at Morehead City, N. C., June 27, 28, and 29, 1904. Practical demonstration will be required in both operative and prosthetic dentistry. Applicants must furnish instruments and materials.

For further information address

J. S. BETTS, *Sec'y*, Greensboro, N. C.

VERMONT BOARD OF DENTAL EXAMINERS.

THE Vermont Board of Dental Examiners will meet at Montpelier, Vt., on Tuesday, July 5, 1904, at 2 P.M., for the examination of candidates to practice dentistry. Headquarters will be at the Pavilion Hotel.

Application blanks, together with rules and instructions to candidates, can be had on application to the secretary. Application, with the fee—ten dollars—must be filed on or before June 27, 1904.

GEO. F. CHENEY, *Sec'y*,
St. Johnsbury, Vt.

OHIO BOARD OF DENTAL EXAMINERS.

THE Ohio Board of Dental Examiners will meet in Columbus, O., June 28, 29, and 30, 1904, at the Hotel Hartman, for examination of candidates for certificates of registration. Application should be filed with the secretary by June 18th.

H. C. BROWN, *Sec'y*,
185 E. State st., Columbus, O.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the theoretical branches in the assembly room of the State house at Trenton, N. J., on July 5, 6, and 7, 1904, sessions beginning promptly at 9 A.M.

The practical prosthetic and practical operative work will be done in Newark. All applications must be in the hands of the secretary ten days prior to the examination.

For further information apply to

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS.

THE South Carolina Board of Dental Examiners will meet at White Stone Lithia Springs, S. C., July 15, 1904.

E. J. ETHEREDGE, *Sec'y*, Leesville, S. C.

DENTAL COMMISSIONERS OF CONNECTICUT.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford, on Thursday, Friday, and Saturday, July 14, 15, and 16, 1904, respectively, to examine applicants for license to practice dentistry, and for the transaction of any other proper business.

The practical examination in operative and prosthetic dentistry will be held Thursday, July 14, at 9 A.M., in Putnam Phalanx Armory, corner Haynes and Pearl sts.

The written theoretic examination will be held Friday and Saturday, July 15 and 16, at the Capitol.

All applicants should apply to the Recorder for proper blanks, and for the revised rules for conducting the examinations.

Application blanks must be carefully filled in and sworn to, and with fee, twenty-five dollars, filed with the Recorder on or before July 7, 1904. Examination fee must be forwarded by money order or certified check. Enclose stamp.

By direction of the Dental Commissioners of Connecticut.

J. TENNEY BARKER, *Recorder*.

ARMY DENTAL CORPS.

CONTRACT Dental Surg. John A. McAlister will proceed to Los Banos, Laguna, for duty. (March 12, D. Luzon.)

Leave for two months, to take effect June 1, 1904, is granted Contract Dental Surg. Douglas E. Foster. (April 28, W. D.)

Contract Dental Surg. Emmett J. Craig, Ord Barracks, Monterey, Cal., will proceed to Fort Rosecrans and San Diego Barracks, Cal., for temporary duty as dental surgeon. (April 21, D. Cal.)

The following named contract dental surgeons, U. S. A., are relieved from duty in the Philippines Division, and will report for transportation to San Francisco about the date set opposite their respective names: S. Davis Boak, July 1, 1904; Clarence E. Lauderdale, July 1, 1904; Hugo C. Rietz, July 1, 1904; Ralph W. Waddell, July 1, 1904; William H. Ware, July 1, 1904; Franklin F. Wing, July 1, 1904; George L. Mason, August 17, 1904; Jean C. Whinnery, August 17, 1904; F. Homer Wolven, September 6, 1904. (April 30, W. D.)

Contract Dental Surg. Charles J. Long is relieved from duty in the Philippines Division, to take effect on or about September 17, 1904, and will then avail himself of the leave of absence granted him. (April 30, W. D.)

DENTAL COLLEGE COMMENCEMENTS.

MEHARRY MEDICAL COLLEGE, DENTAL DEPARTMENT.

THE eighteenth annual commencement exercises of the Dental Department of the Meharry Medical College were held at the Union Gospel Tabernacle, Nashville, Tenn., Tuesday, March 1, 1904.

An address was delivered by Bishop Chas. H. Phillips, M.D., and the valedictory by A. C. Briscoe.

The degree of D.D.S. was conferred on the following graduates:

A. C. Briscoe.....	Missouri	R. E. Jones.....	South Carolina
F. C. Goodwin.....	Arkansas	W. E. Lacey.....	Mississippi
J. R. Hamilton.....	Georgia	Piet Ringeling	South America
R. R. Hawes.....	Georgia	M. B. Williamson.....	Texas
J. J. Johnson.....	Tennessee		

NEW ORLEANS COLLEGE OF DENTISTRY.

THE annual commencement exercises of the New Orleans College of Dentistry were held at the Tulane Theater, New Orleans, on Thursday evening, May 5, 1904.

The degree of D.D.S. was conferred on the following graduates:

John W. Abel	H. Howell Gates	Don A. Mecklin
T. Sidney Bennett	Arthur C. Hammons	Leon J. Priebatsch
George L. Biennu	Fernand A. Keller	Louis J. Redmann
Louis S. Bordelon	Bennett J. Lacour	Seaborn Reynolds, Jr.
Harry D. Condiek	Dominic Major	

MARION-SIMS DENTAL COLLEGE.

THE annual commencement exercises of the Marion-Sims Dental College were held at St. Louis, Mo., Tuesday, April 26, 1904.

An address was delivered by Mr. Sim. T. Price.

The degree of D.D.S. was conferred by M. C. Marshall, D.D.S., dean, on the following graduates:

Joseph Leslie Allen.....	Missouri	Bertel Enos Livingston	Missouri
Jesse Armstrong.....	Missouri	Lawrence R. McCarty.....	Illinois
Richard Lipscomb Atmar.....	Illinois	Charles Elbert McQuaid..	Arkansas
George Lunsford Aubrey..	Texas	Charles Guy Miller.....	Missouri
Thomas Glyndon Bradford	Missouri	Alvin Cornelius Minges..	Missouri
Harry Jacob Braun.....	Missouri	Thomas Niedergerke.....	Missouri
Arthur Dominick Brix...	Missouri	John Bernard O'Brien....	Missouri
Albert Leroy Bryte.....	Missouri	Charles C. Orr.....	Missouri
Wilbur A. Clements.....	Missouri	John Walter Parle.....	Missouri
Whitmel Sharrock Cobb..	North Carolina	William Henry Plumpe...	Missouri
Albert Leon Crume.....	Missouri	Charles Adolph Real....	Missouri
Harry Emerson	Illinois	Charles Ernst Rowe.....	Illinois
Thomas Alvin Fulton...	Illinois	William Henry Shea.....	Missouri
Eugene Morton Garcia...	Missouri	Garrett Louis Steinmesch.	Missouri
Carl Leonard Glenn.....	Illinois	George Harvey Tayman..	Missouri
Emmett Evan Heflin....	Indian Territory	Felix Henry Tschudy.....	Illinois
Solomon A. Helck.....	Illinois	Samuel Franklin Wade..	Missouri
Stephen A. Houche.....	Illinois	Thomas Warden.....	Missouri
Newton Utley Howard....	Missouri	Fred J. White.....	Michigan
Claude Vincent Huff	Missouri		

SOUTHERN DENTAL COLLEGE.

THE annual commencement exercises of the Southern Dental College were held at the Grand Opera House, Atlanta, Georgia, Wednesday, April 27, 1904.

The annual oration was delivered by Hon. Robert Lee Avary.

The D.D.S. degree was conferred by Judge Howard Van Epps, president of the board of trustees, on the following graduates:

Joseph D. Allen	William Eckle Housholder	Leroy Y. Powell
Atticus Haygood Barton	Harry Lee Jarvis	D. D. Roberts
Richard I. Betts	George W. Keen	Sebron Gettys Rutledge
Lucian Frederick Blalock	Ivey DePass Kendrick	Joseph H. Sellers
Samuel Emmett Brice	Thomas Brannon McDonald	Josiah W. Sirmans
Benjamin Clement	Jesse Al. McGahee	Wm. Wilson C. Wall
Joseph Wiley Darsey	Slade Meriwether	Ernest Braxton Welch
Lonnie Mackelmurray Dixon	Richard Randolph Mooror	James Woodward
Carlos N. Dominguez	DeVere Bracey Morris	Joseph M. Woodward
Luther F. Erwin	David B. O'Kelley	Apelles Sasser York
Clayton James Groover	John R. O'Neal	

OHIO MEDICAL UNIVERSITY, DENTAL DEPARTMENT.

THE twelfth annual commencement exercises of the Dental Department of Ohio Medical University were held in the Great Southern Theater, Columbus, Ohio, on Thursday, April 28, 1904.

The annual address was delivered by Lieut.-Governor Warren G. Harding.

Hon. Fred. J. Heer, president of the board of trustees, conferred the degree of D.D.S. on the following graduates:

Theodore Earl Axline
 Wilson Ballard
 George Edison Bell
 Cline Switzer Beurman
 Thura Leonard Bloom
 Eugene Alexander Bobo
 Chauncey Eugene Brooks
 Arthur William Brown
 Mary Alma Cady
 Freeman Campbell
 Otto White Cathers
 Ray Burdell Church
 Harry Kyle Cochran
 Alvin Arthur Constien
 Samuel Bruce Crozier
 Torrey S. Dickerson
 William Robert Dougan
 Edward Leo Dunn
 Ward Adelmarr Frame

Edward J. Frowine
 Robert Bellows Gage
 George Wallace Grant
 Homer Daniel Grubb
 Alva Ray Hengst
 Peter Edward Hixson
 Walter Leon Hogue
 Luster Garfield Ice
 James Emory Jackson
 George Elmo Kalb
 Samuel Marcellus Larriek
 Edward Joseph Loesser
 James Arthur Loughry
 Pope Lemon Marshall
 James Arthur Maxwell
 Leroy Wilson Meek
 Arthur Archer Meredith
 Howard Phipps Michener
 Claude Leyde Miller

William Henry Pelton
 Leman Doston Pfouts
 George Madison Raudabaugh
 Caleb Matthew Sickles
 George Homer Sipher
 Chester Llewellyn Slyh
 Dewey Duane Smith
 Frank Aldrich Spencer
 Edward Everett Sulsberger
 Dessie Dell Thompson
 Justus Martin Warren
 Daniel Hudson Warren, D.D.S.
 George John Weber
 Hermus Seward Welch
 Frank Holland Williams
 Carroll Agnew White
 Chester Arthur White
 Peter William Young
 Daniel Webster Zeis

OMAHA DENTAL COLLEGE.

THE ninth annual commencement exercises of the Omaha Dental College (Dental Department of the University of Omaha) were held in Boyd's Opera House, Omaha, April 29, 1904.

The address to the graduates was delivered by Prof. H. F. Carson.

The degree of D.D.S. was conferred by the chancellor, Rev. David R. Kerr, on the following graduates:

Noah Flood Adair.....Nebraska
 John Franklin Anson.....Nebraska
 Albert Edward Calkins.....Nebraska
 Nels Christian Christensen.....Nebraska
 Clyde Martin Corrington.....Nebraska
 Edwin Charles Emigh.....Nebraska
 Fred Horace Gates.....Iowa
 Bertrand Elmer Goebel.....Minnesota
 Frank Wallace Goodspeed.....Nebraska
 Raymond Lawson.....Nebraska
 Troy Alberta Leach.....Nebraska

Charles Granville Manlove.....Nebraska
 Jamie Pullum Maxfield.....Nebraska
 Edwin Miller.....Nebraska
 Louis Marius Nielsen.....Nebraska
 Zina Alphonso Norton.....Nebraska
 Martin Waldo Park.....Kansas
 Pritchard Roberts.....Nebraska
 Norman Eugene Vredenburg.....Iowa
 Adelbert Eugene Wilkie.....Nebraska
 Roy Eugene Wood.....Nebraska
 Fred Fletcher Whitcomb.....Nebraska

KANSAS CITY DENTAL COLLEGE.

THE twenty-second annual commencement exercises of the Kansas City Dental College were held in the Central High School auditorium, Kansas City, Mo., Saturday, April 30, 1904.

An address was delivered by Rev. Father W. J. Dalton.

The degree of D.D.S. was conferred on the following graduates:

Martin Luther Bond
 Charles Haller Brown
 Edgar L. Burton
 Duane Lee Carney
 Clarence Elijah Cox
 Earl James Cutshaw
 Robert Cotton Davis
 Frederic James Finnigan
 George Addison Hadley

Charles Birdsell Howard
 Harry E. Holaday
 William Jennings Huggins
 Frank Hyatt
 Ernest Winfred Kerr
 Ignatius Loyola Lutz
 George V. McBeth
 Edward Lee Moore

Lloyd Evremonde Rowley
 William Roberts Sanders
 John James Settle
 Arthur Clarence Simmons
 John Henry Solecki
 Hannon Chalmers Stokes
 Emery S. Uhl
 Clarence Hess Van Deventer

WASHINGTON UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of Washington University (Missouri Dental College) were held in the Memorial Hall of the college, on Thursday, April 21, 1904.

An address was delivered by Judge John A. Blevins, and the degree of D.D.S. was conferred by Winfield S. Chaplin, chancellor, on the following graduates:

Calvert Murray Alloway.....Kentucky
Benjamin Sewall Brown.....Texas
Royal Franklin Brown.....Missouri
William Joseph Burcham.....Missouri
Raymond Franklin Daniel.....Illinois
James Wesley Evans.....Missouri
Marshall Early Field.....Missouri
Erastus Gale Gray.....Missouri
Nathan Hirschberg.....Missouri
Edwards Stith Hodgson.....Illinois
Leo Kiefaber.....Missouri
Bernald Leonard Kissel.....Illinois
Valentine Kunz.....Missouri
Jacob Lenzen.....Missouri
Frank Lynott.....Missouri
Luther Earl Leusley.....Missouri
Joseph Emmett Northcutt.....Missouri
Elmer Olds.....Missouri
James Fred Peery.....Missouri
Frank Joseph Pollak.....Missouri
Harry Simon Rehm.....Missouri
Robert Milton Robinson.....Missouri

Lloyd Fletcher Roudebush....Missouri
Harry Frank Rue.....Illinois
John George Schwarz.....Illinois
Thomas Jefferson Selby.....Illinois
Willard Skidmore.....Missouri
David Addison Sloan.....Missouri
Edmond Ellison Smart.....Louisiana
Julian Wright Smith.....Illinois
Albert Henry Sohm.....Illinois
Loren Lamartin Stockton....Indiana
Max Stone.....Missouri
Gabriel Parker Sturgeon....Missouri
Charles Peter Stuttle.....Illinois
Joseph Gerard Tellman.....Missouri
Clarence Arthur Tetley.....Missouri
Elbert Crittenden Traw.....Missouri
Alfred Trigg, Jr.....Missouri
Joseph Howard Tolson.....Missouri
Arthur Walb.....Germany
Robert Emmett Walsh.....Missouri
Harold Clarence Weidlich....Connecticut

NORTH PACIFIC DENTAL COLLEGE.

THE annual commencement exercises of the North Pacific Dental College were held Friday, April 27, 1904, at the First Baptist Church, Portland, Oregon.

The annual address was delivered by Hon. C. E. S. Wood, and the valedictory by Tony Marvin Barlow, A.B., D.M.D.

The degree of D.D.S. was conferred by Dr. J. R. Cardwell on the following graduates:

William Graham Alexander
Tony Marvin Barlow, A.B.
William Roscoe Boyd
Arlett J. Broek
Frank Carl
Wilson H. Darby
Harold Hall Flower

Clarence Hartley
Herman Jacob Harris
Edward Lewellyn Hogan
Franklin Winfield Hollister
Byron Edward Loomis
G. Burwell Mann

Frederic Leonard Marsh
Charles Orlando Nelson
George Delavan Peters
Thomas Forrest Robinson
Ellis Oscar Willson
Berton E. York

CENTRAL COLLEGE OF DENTISTRY.

THE seventh annual commencement exercises of the Central College of Dentistry were held at Indianapolis, Ind., May 3, 1904.

An address was delivered by Samuel E. Earp, M.S., M.D.

The degree of D.D.S. was conferred by H. A. Sampsell, D.D.S., on the following graduates:

Edward C. Bachfield
Denzil C. Barnhill
John Edwin Davey
Wallace P. Fewell

James Edward Hussey
Cecil R. Keirstead
Wallace T. Linn

Roy C. Lortz
James G. Robbins
William S. Robbins

INDIANA DENTAL COLLEGE.

THE twenty-fifth annual commencement exercises of the Indiana Dental College (University of Indianapolis, Department of Dental Surgery) were held Friday, April 29, 1904.

The address was delivered by Prof. R. L. Kelley, president of Earlham College.

The degree of D.D.S. was conferred by Dr. J. N. Hurty on the following graduates:

Jas. T. Anderson	Mary E. Fox	S. B. Roth
A. J. Aughinbaugh	Robert Gillis	J. J. Schneider
C. D. Bachelor	Roy Harris	R. B. Schrock
J. E. Barnfield	Chase Hiatt	Margaret Shaw
D. X. Beechler	H. S. Hickman	R. G. Shaw
J. H. Blind	C. L. Hine	Jos. P. Shelly
Christian Bos	Louis Ieerman	E. B. Simmonds
H. G. Boyd	Otis La Grange	G. E. Snyder
C. L. Byers	O. W. Langston	Jas. W. Stearman
B. F. Chapin	Huber Lowry	H. W. Stephenson
L. S. Chenoweth	E. P. McClung	C. A. Study
W. R. Clickener	E. McElhaney	R. L. Swindler
Anna H. Cluthe	Geo. F. Masters	H. C. Tate
B. A. Conrad	O. H. Meyers	C. E. Thomson
G. A. Craig	F. E. Morton	J. A. Tillett
J. K. Cunningham	W. L. Myer	Floyd Traylor
C. H. Dawson	W. R. Newcomer	Leonard Trinkle
Fletcher Day	Norman Norris	E. C. Van der Volgen
C. O. Dobson	E. R. Oberlin	Bert Vangilder
E. Donmyer	Geo. T. O'Dell	O. A. Van Kirk
Theo. Douglas	Clifford Ogle	Louis Van Swearingen
C. M. Dowell	P. J. Pentecost	A. E. White
E. J. Dykeman	B. D. Peterson	N. G. Wills
D. F. Ellison	W. J. Phillips	Ernest Winter
E. L. Fee	E. D. Poffenberger	J. C. Wright
D. B. Fenstermaker	C. A. Priest	O. M. Young

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

THE annual commencement exercises of the Royal College of Dental Surgeons of Ontario were held in the Y. W. C. Guild Hall, Toronto, Canada. April 29, 1904.

The address to the graduates was delivered by Rev. Wm. Clark, D.C.L.

The degree of D.D.S. was conferred by Sir W. R. Meredith, chancellor of the University of Toronto, and the L.D.S. certificate by H. R. Abbott, D.D.S., president of the Royal College of Dental Surgeons of Ontario, on the following graduates:

Ernest Fred. Armstrong	Stephen Miles Edwards	Walter H. McNally
Daniel J. Bagshaw	Theodore Wm. Elliott	D'Arcy R. Nethercott
Howard Ernest Bedingfield	Arthur Wm. Ellis	George W. K. Noble
James Edward Black	Benjamin Otto Fife	Philip B. Proudfoot
Harry Wilfred Brace	Carmen J. Freeman	Aaron K. Reynolds
Morley Evert Braddon	George Frederick Gilroy	Hatton A. Robertson
Walter Norman Brown	Fred. W. L. Hamilton	Chas. Edward Sale
John P. Brown	M. Stanford Hawkins	J. McDonald Sharpe
T. E. C. Butler	V. LeR. Heath	Leonard E. Stanley
Robert Mills Carruth	C. Douglas Hogan	Archibald Alex. Stewart
Charles Harold Clarkson	Alex. Hugh Hoskin	Robert M. Stewart
Fred. J. Conooy	Arthur Johnston	M. Ross Thomas
Charles Arthur Corrigan	Edward Lane Kenney	Abbie Llewellyn Walker
Wm. Clark Davy	John Lappen	Herbert E. Watson
Albert Colborne DeMille	Herbert Moore Little	Owen Clarence Watson
Clarence Moise Dent	Wm. Joseph Loftus	Elmer F. Willard
James R. Duff	Robt. Arch. McGillvary	Bertram Elmer Wilson
Robert Albert Dunlop	Daniel McMaster McIntyre	Wm. Harrison Wright

LOUISVILLE COLLEGE OF DENTISTRY.

THE annual commencement exercises of the Louisville College of Dentistry were held in Macauley's Theater, May 4, 1904.

An address was delivered by Hon. Bennett H. Young.

The degree of D.D.S. was conferred by W. E. Grant, D.D.S., dean, on the following graduates:

Chas. Atha Aud.....	Kentucky	Silas Hammond McCarty...	Texas
Braxton B. Bell.....	Tennessee	Tolmer W. McKinley.....	Indiana
A. Taylor Boyd.....	Kentucky	Robert Emmett Million....	Kentucky
J. Hogan Bray.....	Kentucky	Noble Francis Mitchell....	Indiana
Marshall Jas. Brooks.....	Missouri	Claude A. Moore.....	Mississippi
W. E. Burt.....	Kentucky	Jesse Adams Moorman....	Kentucky
Henry Duley Chipps.....	Kentucky	Stephen Woodward Morton..	Kentucky
Clarence Cornell Clarke....	Kentucky	Luther Calvin Moss.....	Kentucky
William H. Crawford.....	Kentucky	Charles Newton Neal.....	Illinois
John C. Cunning.....	Kentucky	Bud W. Neely.....	Kentucky
Ralph Dalton.....	Missouri	R. Swayze Neyland.....	Mississippi
William Asa Dean.....	Tennessee	Abraham L. Parker.....	Kentucky
Jas. A. De Loach.....	Mississippi	Winston Wilce Phillips....	Kentucky
M. J. Driscoll.....	Illinois	Andrew Jerome Price.....	Mississippi
Wm. Geo. Ellington.....	Texas	Ivan M. Renfrow.....	Kentucky
Robert W. Dougherty.....	Kentucky	Edwin G. Rhoads, Ph.B....	Kentucky
Edw. Lawrence Fendler.....	New York	Croxton L. Rion.....	Kentucky
Jno. Tinsley Foster.....	Indiana	Charles Milton Rose.....	Kentucky
J. Olivier Fuselier.....	Louisiana	Otto Herman Seifert.....	Illinois
G. Grayson Garrison.....	Illinois	John Clifton Settles.....	Kentucky
Jas. Britain Garrard, M.D....	Texas	James A. Shaw.....	Louisiana
J. Bailey Gravlee.....	Alabama	Russell Graham Sherrill... North Carolina	
Henry Borden Green.....	Kentucky	James William Smith.....	Kentucky
Wm. Spaulding Green.....	Kentucky	Delbert Lee Sparks.....	Kentucky
J. Edwin Hazelton.....	Maine	W. Ralph Sugg.....	Mississippi
Frank B. Henderson.....	Mississippi	Marvin L. Thomas.....	Kentucky
James Monroe Hill.....	Virginia	Edwin Mitchell Topp.....	Mississippi
John Thomas Hunt.....	Texas	Homer Douglas Vardaman... Mississippi	
Geo. Anthony Kraus.....	Kentucky	Carl M. Wiggins.....	Mississippi
Arthur McCluer Laird.....	Kentucky	Orlie D. Wilson.....	Kentucky
Wm. Milton McCall.....	Indiana	Frederick Wolfean.....	Texas

BALTIMORE MEDICAL COLLEGE, DENTAL DEPARTMENT.

THE ninth annual commencement exercises of the Dental Department of the Baltimore Medical College were held at the Lyceum Theater, Baltimore, Friday, April 29, 1904.

The valedictorian was Rev. Curtis Lee Laws, and the degree of D.D.S. was conferred by Prof. S. K. Merrick, president of the board of directors, on the following graduates:

J. Homer Barre.....	Massachusetts	C. C. Marchant.....	Virginia
Irwin C. Botts.....	Maryland	Henry K. Montell.....	Maryland
E. N. Cochran.....	Maryland	Sherod H. Moody.....	Alabama
J. A. Coutremarsh.....	New Hampshire	Frank A. Motis.....	Nebraska
W. C. Flora.....	Maryland	Irvin S. Olliff.....	Georgia
Samuel Friedman.....	New York	David O. Pollock.....	New York
Lawrence F. Gilleran.....	Massachusetts	Chas. L. Ritter.....	New Jersey
John T. Hepworth.....	New York	Earle M. Slate.....	Massachusetts
J. Derby Hood.....	Maryland	B. E. Smiley.....	Connecticut
E. A. Lenert.....	Texas	H. E. F. Tiesing.....	Connecticut
D. Alonzo Long.....	Pennsylvania	J. Hoffman Wooden.....	Maryland
John D. MacMillan.....	New Brunswick	Leon B. Wright.....	New York

UNIVERSITY OF MARYLAND, DEPARTMENT OF DENTAL SURGERY.

THE annual commencement exercises of the Department of Dental Surgery of the University of Maryland were held in Chase's Lyceum Theater, May 2, 1904.

The address to the graduates was delivered by Eugene O. Dunne, Esq., and the class oration by James E. Shreeve, Jr.

The degree of D.D.S. was conferred by Bernard Carter, Esq., provost, on the following graduates:

Harry Lewis Berkheimer....	Pennsylvania	William J. Koelz.....	West Virginia
John C. Bohnson.....	Maine	John Frederick Koerner..	Maryland
John Calvin Bowman.....	Virginia	Herbert Kuhnen.....	Germany
Millard C. Brobst.....	Ohio	Harry C. Leib.....	Maryland
Archie C. Brooks.....	New York	Thomas F. Littlejohn....	South Carolina
J. Oscar Brown.....	Pennsylvania	Wilfred S. McCardell....	Maryland
Monteath Dewain Cameron..	New York	Frank G. MacFarlane....	Canada
J. DeLaney Carlton.....	North Carolina	William Francis McNulty..	Maryland
Charles Eugene Chew.....	Maryland	I. Mitchell Mann.....	North Carolina
Benjamin B. Cion.....	New York	Milton Marks.....	New York
Emory W. Crowe.....	Maryland	Edward Booth Miles....	New York
Charles Edward Dare.....	New Jersey	Frank Willis Montgomery..	Massachusetts
Henry Evan Davis.....	Virginia	S. Whiteford Moore.....	Pennsylvania
Adolph Degenring.....	New Jersey	John Augustus Morris....	New York
Fredrick W. Dobson.....	Nova Scotia	Robert J. Morrison.....	North Carolina
Raymond Otto Dorman....	New York	Robert P. O'Brien.....	Texas
Bert E. Doyle.....	New York	Alfred Hunter Oliver....	Canada
Enoch Love Ellison.....	West Virginia	Harry Austin Palmer....	Virginia
Arthur M. Felix.....	Massachusetts	Alfred Joseph Piche.....	Vermont
Edgar A. Firey.....	Maryland	Jac C. Reichley.....	Pennsylvania
John A. Flood.....	New Hampshire	Charles Hammett Rogers..	Rhode Island
Maxwell Sibley Foster....	Maryland	William Robert Ross....	Canada
John Head Gayle.....	Louisiana	A. Worthington Seippel..	Maryland
Marwood S. George.....	Canada	William C. Shirley.....	Virginia
George R. Gleason.....	Florida	James Edwin Shreeve, Jr..	Maryland
Frank Aloysius Golden....	Connecticut	Charles Francis Smith....	Jamaica, B. W. I.
Walter Engel Green.....	Maryland	Stanley Baxter Smith....	Canada
Lynwood Carr Holland....	Virginia	Ephraim Stone.....	South Africa
Roger L. Hussong.....	New York	Fred. P. W. Walker....	Massachusetts
Beverly Jones.....	West Virginia	James Monroe Wallace....	South Carolina
Ernest J. Jones.....	Canada	George Gilman Wheeler....	Rhode Island
Edmund Kahn.....	Maryland	Jonathan R. Willis.....	Pennsylvania

CINCINNATI COLLEGE OF DENTAL SURGERY.

THE eleventh annual commencement exercises of the Cincinnati College of Dental Surgery (Dental Department of Ohio University) were held at Cincinnati, Thursday, May 5, 1904.

An address was made by Prof. W. H. Gensley, D.D.S., secretary of the faculty, and the valedictory was delivered by Judge Howard Ferris.

The degree of D.D.S. was conferred by Prof. G. S. Junkerman, M.D., D.D.S., dean, on the following graduates:

M. Logan Blanchard.....	Ohio	Henry J. Longcamp.....	Indiana
Ainsley S. Canon.....	Pennsylvania	Carroll A. McNutt.....	Ohio
N. Lincoln Dailey.....	Ohio	Geo. M. Marshall.....	Pennsylvania
Geo. J. Forestner.....	Ohio	Merton F. Robenalt.....	Ohio
Francis A. Geon.....	Ohio	Jacob Schwartz.....	Ohio
Anna B. Hewins.....	Kentucky	Edward J. Shannon.....	Ohio
William G. Houston.....	Kentucky	E. D. Snell.....	Ohio
J. Montgomery Lacock....	Kentucky	Herbert B. Turner.....	Indiana
Charles A. Linn.....	Kentucky	Joseph H. Weaver.....	Ohio

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE forty-eighth annual commencement exercises of the Pennsylvania College of Dental Surgery were held at the Academy of Music, Philadelphia, Pa., on Saturday, April 30, 1904.

The address to the graduates was delivered by Prof. J. Bird Moyer.

The degree of D.D.S. was conferred by I. Minis Hays, M.D., president, on the following graduates:

J. W. Akers.....	Pennsylvania
Chas. M. Austin.....	Pennsylvania
Esperanza P. Avila.....	Mexico
C. G. Barker.....	New Jersey
Charles F. Bailey.....	Pennsylvania
Jesse M. Belber.....	Pennsylvania
Jno. J. Blackman.....	New Jersey
Samuel Blitstein.....	Pennsylvania
H. Buechler.....	New Jersey
Bernet Cantor.....	New York
George F. Carling.....	Pennsylvania
G. H. Clarke.....	Pennsylvania
P. H. Cleary.....	Massachusetts
Joseph J. Coltune.....	Pennsylvania
Amanda B. Conrad.....	Pennsylvania
Thomas J. Connelly.....	Pennsylvania
H. E. Corbett.....	Pennsylvania
E. S. Coultres.....	Canada
A. L. Cramer.....	Pennsylvania
A. R. Curry.....	Pennsylvania
R. N. Cushman.....	Massachusetts
O. E. Day.....	New York
C. V. L. Diener.....	Pennsylvania
Mary J. Donovan.....	Delaware
Edith W. Eaton.....	Pennsylvania
Elizabeth Edmondson.....	Pennsylvania
Charles A. Ely.....	Pennsylvania
M. D. Eroh.....	Pennsylvania
Harry A. Evans.....	Pennsylvania
David Feldman.....	Pennsylvania
Joseph Flaherty.....	Pennsylvania
L. F. Folz.....	New Jersey
Leon C. Gage.....	New Jersey
H. K. Gerow.....	New Jersey
Joseph A. Getzow.....	Pennsylvania
Adam M. Geesey.....	Pennsylvania
Adolph S. Glass.....	Pennsylvania
Marciano R. Gomez.....	Cuba
L. M. Goodenough.....	New Jersey
Frank Gordon.....	Pennsylvania
Ray D. Gutelius.....	Montana
J. S. Hamilton.....	New Jersey
Benjamin Haytock.....	Pennsylvania
Louis M. Heckman.....	New Jersey
F. L. Henderson.....	Pennsylvania

John G. Hunter.....	New Jersey
E. Jauregui.....	C. America
Chas. Jeanneret.....	Switzerland
James W. F. Johnson.....	Georgia
Joseph I. Leet.....	Pennsylvania
William Levine.....	New Jersey
W. L. Lloyd.....	New Jersey
M. Lorentz.....	New Jersey
J. D. Maloney.....	Massachusetts
M. Mandelstam.....	Pennsylvania
Amos M. Marsh.....	New York
Albert Mehrer.....	Pennsylvania
Herman J. Meyers.....	Pennsylvania
H. G. Molson.....	Pennsylvania
J. A. Monteith.....	Illinois
S. Leland Moore.....	Pennsylvania
O. P. Morgan.....	Pennsylvania
I. F. Murphy.....	Pennsylvania
James P. O'Rourke.....	Pennsylvania
J. Edw. Onley.....	Florida
C. W. Outen.....	Pennsylvania
William F. Peak.....	Kentucky
S. S. Peek.....	Pennsylvania
Uriah Phillips.....	Pennsylvania
J. H. Powers.....	Massachusetts
J. E. Quigley.....	Massachusetts
Jose B. Ramirez.....	Porto Rico
J. L. Richie.....	Pennsylvania
Isaac Schechter.....	Russia
Albert Seelig.....	New York
John T. Simpson.....	Pennsylvania
Edward Slaton.....	Kentucky
W. H. Smith.....	Pennsylvania
Warren H. Stevens.....	New York
Leslie M. Stevenson.....	New York
Peter Stirling.....	Massachusetts
James S. Sullivan.....	Pennsylvania
L. W. Swartz.....	Pennsylvania
D. W. Thomas.....	Canada
A. Trigueros.....	C. America
S. H. Volk.....	Pennsylvania
W. L. Walling.....	New York
Joseph Weinman.....	New York
J. Hod. Williams.....	Connecticut

PHILADELPHIA DENTAL COLLEGE.

THE forty-first annual commencement exercises of the Philadelphia Dental College were held at the Academy of Music, Friday, May 6, 1904.

The address to the graduates was delivered by Prof. Henry C. Boenning, M.D., and the valedictory by Jas. P. Reid, D.D.S.

The degree of D.D.S. was conferred on the following graduates:

William Winfield Albee.....	Maine	Ralph E. Macdonald.....	Canada
Heman Anderson.....	New Jersey	Mads P. Madsen.....	New Jersey
C. Benjamin Andrews.....	Pennsylvania	Harry P. Massoth.....	New York
Aram Ussep Arevian.....	Turkey	Raul Masvidal.....	Cuba
Harold J. Baker.....	New York	William Henry Matthews....	Pennsylvania
Allan Romaine Barnum.....	Connecticut	James Maurer.....	Pennsylvania
Joseph Wilhelm Beiser.....	Nebraska	Thomas William Mercer....	Bermuda
Edgar P. Bell.....	Pennsylvania	Gerald Elroy Mix.....	Pennsylvania
James W. Bell.....	Canada	John Joseph Mulcahy.....	Connecticut
Oscar W. Bennett.....	New Jersey	Edward Francis McCarthy...	Connecticut
Norman Theodore Benz.....	New York	Matthew T. O'Brien.....	New York
Roy Emmet Black.....	Pennsylvania	Thomas Francis O'Keefe....	New York
Walter D. Bray.....	Connecticut	Charles Edward Paige.....	Australia
William Beckwith Brewster..	Connecticut	Walter Oscar Paul.....	Australia
Lex Rowley Browne.....	Pennsylvania	George Sanford Peck.....	Pennsylvania
Frank John Buchanan.....	Connecticut	Charles P. Phillips.....	Massachusetts
Charles Albert Burbridge....	Michigan	Leon Willard Platner.....	New York
Edward John Callahan.....	Massachusetts	Julius M. Politzer.....	Pennsylvania
Angus Campbell.....	Canada	Morris Propper.....	Pennsylvania
J. Luis Cariaga.....	Bolivia	William C. Raith.....	New Jersey
Edwin Oliver Clapp.....	Massachusetts	Benigno Ramirez.....	Porto Rico
Samuel Edwin Corle.....	New Jersey	James P. Reid.....	Rhode Island
Earl D. Craig.....	Pennsylvania	Frank Lawrence Roberts....	Pennsylvania
Ralph Morton Danforth.....	Massachusetts	Frederick P. Robertson....	Canada
Edward McF. Dennison.....	New York	William J. Robinson.....	Ireland
Edward John Dougherty.....	Pennsylvania	Gustav Adolph Schlichter...	Germany
Harry Epstein.....	New Jersey	Harry Lacy Sexton.....	New Jersey
Robert Richard Ewald.....	Hayti	Federico Alberto Smith.....	Honduras
Joseph A. Farrel.....	Connecticut	William Alonzo Spear.....	Maine
Frank C. Farrell.....	New Jersey	Dallas Edward Speed.....	North Carolina
Edwin Cross Fitzgerald.....	Pennsylvania	Albert Joseph Stearne.....	Pennsylvania
Albert Earl Franklin.....	New York	Samuel S. Steinberg.....	Russia
J. Norbert Gelson.....	New York	G. Newman Storm.....	Pennsylvania
William Franklin Good.....	Washington	B. Frank L. Swarr.....	Pennsylvania
William Nelson Gunning.....	Canada	Walter West Swazey, Jr....	Massachusetts
Joseph Francis Haley.....	New York	Clayton C. Timbrell.....	New Jersey
Michael Henry Healy.....	Rhode Island	Sara Verona Tomlinson.....	New Jersey
William A. Hicks.....	Canada	Charles William Trotham...	Canada
Everett Joseph Hinckley....	Maine	Charles R. Uhle.....	New Jersey
Stanley Fay Holaday.....	Iowa	Franklin H. Van Winkle....	New Jersey
Oscar Charles Horandt.....	New Jersey	Albert Joseph Vaugier.....	Massachusetts
Rupert V. Hosking.....	New Zealand	Ermelindo Vidal.....	Porto Rico
Frank Joseph Kenna.....	New York	C. Clayton Ward.....	Connecticut
Joseph Henry Kenna.....	New Jersey	Delton C. Watt.....	Vermont
Benjamin A. Kreidmann.....	New York	Charles J. Weidknecht.....	Pennsylvania
Hermann M. Krukenberg....	Pennsylvania	Richard Eastlake West.....	Pennsylvania
Matthew Henry Laity.....	Connecticut	George Wieser.....	Connecticut
John Francis Light.....	Massachusetts	Silas Wade Williams.....	Pennsylvania
Arthur S. Litten.....	New York	Corydon Henry Wolcott.....	New York
William Lock.....	Pennsylvania	F. Hawley Wolverton.....	Ohio

BALTIMORE COLLEGE OF DENTAL SURGERY.

THE sixty-fourth annual commencement exercises of the Baltimore College of Dental Surgery were held in the Maryland Theater, Baltimore, Md., Friday, April 29, 1904.

The annual oration was delivered by Hon. J. B. McCabe, and the valedictory by C. P. Norris.

The degree of D.D.S. was conferred by M. W. Foster, M.D., D.D.S., dean, on the following graduates:

J. C. Allen.....	Massachusetts	W. J. Hogan.....	Connecticut
W. V. Ankeny.....	Pennsylvania	W. J. Jackson.....	Massachusetts
W. G. Armstrong....	Nova Scotia	C. Jensen.....	Ohio
J. A. Askew.....	Mississippi	B. H. Keeler.....	Connecticut
F. J. Barclay.....	Pennsylvania	F. Keidel.....	Texas
F. E. Beckwith.....	Nova Scotia	A. P. Kilbourne.....	Pennsylvania
J. A. Bishop.....	New Jersey	R. H. Koehler.....	Texas
E. C. Blackmore....	Virginia	G. T. Leighton.....	Canada
E. S. Blythe.....	Canada	G. W. Loewe.....	Maryland
A. J. Bordelon.....	Louisiana	C. S. McCullum.....	Virginia
H. R. Bristol.....	Vermont	R. H. McLaughlin....	North Carolina
J. E. Caplen.....	Texas	T. R. Manakee.....	Maryland
F. J. Corrigan.....	Connecticut	F. C. Martin.....	Massachusetts
A. B. Cummins.....	West Virginia	T. H. Mitchell.....	Maine
L. A. D'Argy.....	Maine	D. J. Monroe.....	Nova Scotia
J. C. Daughy.....	Maine	D. F. Morrisson.....	Illinois
D. A. Davison.....	Virginia	B. L. Neiley.....	Nova Scotia
H. W. Dellinger....	Maryland	J. P. A. Nolan.....	Rhode Island
J. A. Denike.....	Canada	C. P. Norris.....	North Carolina
E. S. Dunning.....	New Jersey	T. F. Parks.....	Nova Scotia
E. N. Eddy.....	West Virginia	B. A. Rees.....	West Virginia
J. B. Fernandez....	Porto Rico	L. Rinsland.....	Pennsylvania
E. R. Fichtner.....	Pennsylvania	J. E. Robillard.....	Massachusetts
D. C. Finnigan.....	Vermont	H. O. Rue.....	Maryland
W. B. Flynn.....	Massachusetts	J. C. Sharp.....	Canada
G. F. German.....	Pennsylvania	W. T. Sims.....	Ohio
F. W. Gettier.....	Maryland	H. B. Small.....	Vermont
T. A. Gibbons.....	Massachusetts	T. L. Smith.....	Alabama
A. D. Golding.....	Massachusetts	J. M. Somers.....	Maine
T. R. Grady.....	Prince Edward Island	H. Stoner.....	New York
F. A. Grey.....	Indiana	A. K. Thompson.....	Virginia
L. E. Guy.....	Virginia	L. H. Vermillion.....	West Virginia
H. H. Hann.....	New Jersey	F. W. Watson.....	West Virginia
B. B. Hinman.....	Connecticut	I. R. Wheeler.....	Maryland

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING APRIL 1904.

April 5.

- No. 756,336, to LYTER H. CRAWFORD. Dental handpiece.
 No. 756,354, to SYDNEY O. GOLDAN. Inhaler.
 No. 756,506, to WM. N. KIDDER. Artificial tooth-crown.

April 12.

- No. 756,913, to HARRY W. TRUITT. Vulcanizer.
 No. 757,013, to GEORGE L. BENNETT. Anesthetic-vapor inhaler.
 No. 757,133, to EDMUND B. MARSHALL. Holder for dental bite-takers.
 No. 736,878, to CARL H. SEEGER. Design for dental tool handle.

April 19.

- No. 757,885, to JAMES A. COCHRANE. Antiseptic tooth-brush holder.
 No. 757,907, to FREDERICK FRITZ. Tooth-brush with washing device.
 No. 757,938 to WM. T. LYON. Dental appliance.

April 26.

- No. 758,109, to HARRY E. SANDIFORD. Tooth-brush.
 No. 758,422, to WM. CRENSHAW. Dental matrix retainer.



For my only
son, Smith Turner.

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ORIGINAL COMMUNICATIONS.

GOLD IN DENTISTRY.

By B. HOLLY SMITH, M.D., D.D.S., Baltimore, Md.

(Read before the New York State Dental Society, at its annual meeting, Albany, May 13, 1904.)

IT must be noticed that caries is a destructive process and that its ravages result in a loss of tissue proportional to the extent of the disease. The dental operator, therefore, who essays to repair these ravages is a builder to that extent, and should be capable of using with equal facility such materials as are best suited to the conditions of the structure to be repaired. Just as we look with suspicion upon the judgment of a clever mason who because of his success in the use of stone, and mindful of its beauty of form and permanence of structure, contends that it is the only building material, so we must deprecate and regard with equal distrust the judgment of the dentist whose cleverness in the use of one filling material prompts him to abandon all others. The great preponderance of mineral constituents in the structure of the teeth, together with the lack of permanence of form and the tendency to disintegration of the vegetable stoppings which have been experimented with as filling materials, would seem to present a rational explanation of the anomalous procedure of building metallic plugs into

living teeth to restore their original contour and protect them from violence and extraneous irritants. While we do not desire to detract from the value of any other filling materials, the object of this paper is to consider in some detail the merits of gold.

GOLD.

This metal, which has been highly esteemed in all ages and possibly never more highly than at present, possesses, when specially prepared for the purpose, qualities peculiar to itself, rendering it the most valuable of all materials whose use has been attempted or suggested in the stopping of teeth. For this purpose it has gained its greatest popularity in the United States, where its skilful use has attained the highest excellence. In some sections of Europe the opportunity for the development of the same skill has been partly abridged by a pronounced prejudice against any display of the metal, however slight, in the mouth. How much this sentiment has been fostered by those who have failed to acquire cleverness in its manipulation, it

is impossible to say; certainly it is true, even in this country, that the patients of the "old school" practitioners, who have had only flush fillings of non-cohesive gold in the front teeth, are usually very intolerant of contour work involving display of gold. Indeed, the cultivated and refined of all sections may be found to manifest, much to the disgust of some dentists, a woful lack of appreciation of these shining evidences of skill and ingenuity. This, if nothing else, must force the conclusion, that however superior and highly valued this material for saving teeth, it is by no means in every sense ideal; and its limitations will often force the operator to resort to the use of materials which possess few of its merits, but which excel it in some particular.

The properties of this royal metal which contribute to its usefulness are—

First: Its softness, which enables it to be adapted accurately and with comparative ease to the inequalities of the cavity surface.

Second: Its tenacity, which facilitates the introduction and adaptation, and in addition enables it to resist stress in contour.

Third: Its comparative density, developed by manipulation, which enables it to resist without appreciable wear the force of mastication.

Fourth: Its freedom from chemical change, and from destruction or partial disintegration by contact with any agents likely to be met with in the mouth.

The most pronounced objection to gold is its conductivity; when condensed into a homogeneous mass it possesses this quality to a decided degree, making it necessary often to abandon its use, or resort to some interposing non-conductor to counteract this property. Its lack of resemblance in point of color to the tooth-substance is also to be mentioned; but while this is granted, it must be remembered that it is less objectionable in this respect than any other metal, and its appearance can be made softer and more agreeable by avoiding the burnisher. The difficulties of its successful manipulation might probably be urged as an objection to gold as a filling material; yet while it

is true that it does require a certain skill and dexterity to receive its best offices, it can be said to respond reasonably well to painstaking effort, and any careful operator can in one form or another acquire a knack of producing good stoppings with this material. Conscientious effort and a knowledge of necessary conditions are, however, essential to all who essay to use it.

Weighing carefully its disadvantages, and reckoning with equal care its advantages over other stopping material, the palm must be yielded to gold as the most useful substance with which teeth can be filled.

It is accepted by most authorities that the use of gold as a filling material is of very ancient origin. Dr. B. J. Cigrand, in a very interesting little book entitled "The Rise, Fall, and Revival of Dental Prosthesis," has collected quite an amount of information concerning ancient dentistry, and quotes undoubted authorities to prove the use of gold fillings by the Egyptians, Greeks, Etrurians, and other ancient nations. During the long blank period known as the Middle Ages the science of dentistry seems not only to have been neglected, but to have retrograded from its original position as a department of medicine, to become an adjunct of the blacksmith's, barber's, or jeweler's trade. Naturally the merest temporary relief was attempted under these circumstances, and not until the eighteenth century do we find any evidence of extended dental work. It is from this period, then, that modern dentistry dates its beginnings, and here we find the first authentic description of the use of gold as a stopping.

The earlier practitioners in this country and in Europe acquired an amount of skill in the use of this metal which secured for some national reputations; and when it is considered that some of these beat out their own foil from coin, their cleverness and dexterity are magnified. Only the simpler forms of operations were possible under such limitations—and, indeed, these conditions must have prevailed in a measure until the discovery of the cohesive property of gold.

The absolute purity of the gold from which foil is to be manufactured, which is recognized as a prime essential today, must have been only a relative exaction in the earlier days of dentistry. It is even possible that the great difference in the working qualities of the various preparations of gold foil offered in the markets at the present time is the result either of a disregard of this essential, or of the well-known difficulty of separating gold from some of the impurities which are often found to contaminate it. The gold foils of America, however, are in general relatively free from impurities; and the art of their manufacture is considered to have attained in this country a very high standard of excellence.

COHESIVE GOLD FOIL.

Cohesion is a property inherent in gold, as indeed in all metals under favorable conditions, only that in gold this property is more easily manifested, because when pure its attraction for the elements of the atmosphere is not of sufficient force to operate against such manifestation. The development of this property of cohesion is effected in its greatest intensity by a process of annealing, or the application of a sufficient amount of heat to effect combustion of such adventitious substances as may have interfered temporarily with the expression of this quality, as well as to restore to their normal molecular arrangement the ultimate constituents of the element. Under such conditions, so great is the attraction of the cohesion that separate particles may be condensed into a homogeneous body in which the relation is as intimate as though all were fused into one mass.

The softness of this metal and its behavior under manipulation, as well as its ready return under the influence of heat to what we may term its normal condition, where the expression of such qualities as its cohesion are tolerably constant, would indicate that this property of cohesion is the result of a molecular attraction. This we must assume will prevail until such time as the normal

relation between the molecules is interfered with by manipulation, or until a sufficient amount of foreign matter has collected upon its surface to prevent the expression of this attraction.

The absolute purity of gold is not always essential to the development of cohesion, since it may be alloyed with some of the metals not readily oxidized without interfering with this property. The presence of these metals, however, will invariably interfere with other desirable qualities of the foil, making it less ductile, less malleable, and consequently less tractable.

The constancy of the quality of cohesion in gold forces the conclusion that in the process of its early manufacture and use, cognizance must have been taken of this property; no doubt great effort and pains were expended to obviate and suppress it; since as gold foil was handled in those days it must have seriously interfered with its successful use. To Dr. Robert Arthur the credit is therefore due, not that he was the first to note this property, but that his far-seeing eye outlined, through the development of it, a field of usefulness which extended far beyond the then existing limitations of gold fillings.

It would be difficult to estimate the extent of improvement growing out of the suggestion to make use of cohesive gold. The fact that a few have been carried away by a fascination for this form of material, and the methods of its employment, to its exclusive use, or that many have been deluded and deceived into a belief that they were saving teeth by building irregular and imperfect though cohering masses of gold into cavities, rather detracts from the real worth and true glory of cohesive gold, but from an unprejudiced and dispassionate standpoint it must be regarded as the sheet-anchor of operative dentistry today—a material which the enthusiastic vanguard with all its fuss and feathers cannot stretch to an absurdity, and which the miserable straggler with his dilapidated and bedraggled failures full upon him cannot contract to a nonentity.

The value of the property of cohesion

will not appear to those whose experience and study have not led to a correct understanding of certain peculiarities imparted to gold by the possession of this property. In the hands of the ignorant its very merits become sources of danger, if not causes of failure. A familiarity with its use conduces to respect, almost reverence, for the quality which establishes its idiosyncrasies.

Of all gold, cohesive gold should be pure. It should be guarded with the utmost caution from contamination or deterioration. It should be handled as little as possible; never roughly or carelessly, and be freshly annealed just prior to using. With attention to these precautions the careful and skillful operator is enabled to condense into a given cavity a gold stopping of a density equal to a cast nugget of the metal, which will hermetically seal the margins of the cavity and be capable of receiving the highest polish.

NON-COHESIVE GOLD FOIL.

Cohesion in gold being an expression of a natural quality, it would seem extremely difficult to account for the forms of foil known as non-cohesive and mis-called "soft" gold, on any other ground than that of contamination from agents known to obstruct the expression of this quality upon the surface without destroying the property in that portion of the metal between the surfaces. Dr. Black says that "All non-cohesive gold is made non-cohesive by chemical manipulation."

The analyses of non-cohesive gold which have been made have demonstrated the specimens analyzed to be relatively pure. How much if any responsibility for the loss of cohesion attaches to the small impurity found to exist in these specimens is not apparent; it seems plain, however, in studying these analyses that specimens of cohesive gold analyzed have shown greater purity; and the inference is natural that the contamination is responsible for the loss of cohesion. When gold in a fine state of division is heated with sodium carbonate and sulfur, a sulfid is formed capable of resisting a

red heat; and while this does not resemble non-cohesive gold foil, in that no tenacity or persistent continuity exists, it is possible that a limited surface effect might be produced by some such agent, arresting cohesion to that extent, and not altered by annealing.

Dr. Black says, "Any gas into which sulfur or phosphorus enters, condensed upon the surface of gold, cannot be perfectly driven off by annealing; and the welding property of the foil cannot be redeveloped."

If the statement of the manufacturer is to be allowed, which claims absolute purity for non-cohesive gold, the most plausible theory is that of allotropism, i.e. the existence of two chemically identical but physically different forms of the same element. In this case the passage from one form to another must have been brought about after the leaf was rolled or beaten, as gold which is absolutely and entirely non-cohesive cannot be beaten into leaf. There seems little probability that a degree of purity compelling such an explanation has been or will be attained in this form of gold.

An interesting and significant reference to this subject is made by Dr. C. J. Essig, as follows: "Some of the manufacturers of gold foil for dental purposes produce a 'soft' variety, in which cohesiveness cannot be developed by heating. This quality may be attained by alloying, or by depositing carbon upon the surface, as the latter cannot be driven off by heating."

The statement has been made by one of the most experienced manufacturers of dental foil in this country, that he makes the two varieties of cohesive and non-cohesive foils from the same ingot. As his non-cohesive or "soft" foil is unsurpassed in the qualities which are desirable for such a foil, it seems proper to assume, therefore, that the development of these qualities is due either to some treatment of the surface or to mechanical management during lamination, and not to alloying.

The manufacture of non-cohesive gold foil, properly so called, is not, it would seem, understood by every goldbeater.

Some of them prepare only cohesive foil, while others offer for sale a so-called non-cohesive foil, which is really nothing more than an unannealed sample of the cohesive type and which is destitute of the peculiar "kid-like softness" and toughness which permits it to be carried forward by the plugging instrument into deep cavities without fracture. The extent to which the characteristic qualities of cohesiveness, etc., may be modified or entirely lost by the absorption of gases, has yet to be fully studied.

Dr. Guilford says: "The process of imparting non-cohesion to pure gold is kept a secret by the few who understand it. Truly non-cohesive gold possesses the quality of softness or pliability in a remarkable degree. This it could not have without the final annealing after beating, which, in restoring the softness, would also re-establish its cohesiveness. It is therefore reasonable to suppose that it is again deprived of its cohesiveness by some subsequent treatment that causes its surface to be overlaid with a film of such character as not to be readily dispelled or driven off by heat. Treating it with a solution of ferrous sulfate, or exposing it to the vapors of sulfur or phosphorus would probably produce this result; but just what process is employed we cannot say. That the treatment employed in rendering foil non-cohesive is surface treatment is shown by the fact that when two superimposed sheets of this gold are cut through with a pair of shears, the newly-cut edges unite much in the same manner as cohesive gold.

The writer has seen a cavity filled with non-cohesive gold by pricking it in with two cambric needles set in wooden handles. The filling when completed was dense, and the layers of foil were so well united that they could not be separated. While nominally a non-cohesive filling, the layers were really held together by pure cohesion at the point where they were pricked, for the needle in penetrating two or more layers at a time, exposed the central cohesive portion of the layers at the point of puncture and brought them into direct contact, resulting in union. Further evidence that

non-cohesive foil has had its peculiar property imparted to it by contamination with other metallic substances is furnished by melting in the flame of an alcohol lamp a rope of cohesive and one of non-cohesive foil. The globule resulting from the cohesive foil will be bright and clean, while that from the non-cohesive will be tarnished or oxidized, clearly showing the presence of extraneous matter.

Non-cohesive gold has for many years been sold under the less distinctive name of soft gold. The latter term, however, is a misnomer, for, as we have stated, all pure gold is soft unless this property has been interfered with by hammering or rolling. No foil can possibly be softer than cohesive foil, but the misuse of the term has arisen from the fact that in the manipulation of non-cohesive foil the layers will slide over one another without cohering, which seems to emphasize or exaggerate the impression of softness. The absence of this sliding or gliding quality in cohesive gold naturally but improperly suggests the idea of hardness. In large and accessible cavities, where no necessity exists for the sliding of gold upon gold, cohesive foil will be found to be equally as soft and tractable as the non-cohesive variety.

The manner of using non-cohesive gold is entirely different from that of using other forms; it must be regarded as possessing greater adaptability, and its use is therefore of special advantage in remote cavities on buccal and approximal surfaces, where no contour is essential and where no wear of mastication would be likely to affect it; it is also useful in lining cavities in other situations. The necessity for extreme caution in handling cohesive gold does not obtain to the same extent with the non-cohesive; nor is the deterioration of its working qualities so easily accomplished. The same necessity obtains, however, for its careful preparation into definitely arranged form for introduction into a cavity; no carelessness or haphazard lack of method is ever excusable in the preparation of any form of gold for filling teeth.

SEMI-COHESIVE GOLD.

A form of gold foil known as semi-cohesive is prepared by some of the manufacturers, and its use advocated by many of the best operators. When gold, which can be made cohesive by annealing, is used as non-cohesive foil in the foundation or first third of a filling, this semi-cohesive form may serve as a bond of union between the non-cohesive and the extra-cohesive employed in the last third; bringing the two together by a regular gradation from the entire absence of cohesion to the manifestation of that property in its greatest intensity.

Gold to be used as non-cohesive gains nothing, and, it is thought, loses much by any approach to resemblance to cohesive foil; in fact the friction of the instrument developing cohesion prevents the execution of a method accepted as ideal for non-cohesive foil; a mechanical union is all that is expected, and if any other be secured, it must not be at the expense of its pliability. It is more than probable that a failure to appreciate the finer distinctions and differences in the methods of using the two forms is at the root of the prejudice that exists in the minds of some against either form of this material.

Semi-cohesive gold foil cannot be made to fill the requirements of non-cohesive gold; it is forever barred by the possession of the slightest cohesion, and can only be regarded as a poor form of cohesive gold, which may be improved by annealing.

PREPARATION OF VARIOUS FORMS OF GOLD.

Cohesive gold foil. With an increased familiarity in the use of this form of gold, it will appear that certain considerations developed by its peculiarities are essential to its successful management. To take the fullest advantage of its cohesion, the regularity and uninterrupted character of the contact is of the greatest importance. If the density of the stopping be an essential, it is believed that this can be secured and the greatest integrity of the cohesive property retained by using the gold in the

form of ribbon or strips. Energy developed is strength spent; cohesion excited and satisfied in spots will interfere with a complete or full satisfaction, because of the rigidity developed at the point where cohesion has taken place. To overcome this rigidity requires the repeated application of force, which to some extent interferes with or destroys on the surface, where the force is applied, the virgin cohesion.

Gold foil is furnished in sheets contained between the leaves of a book, and such fraction of these sheets may be cut off for the preparation of tape, strip, rope or pellet as may be deemed suitable for the purpose for which it is intended. Great importance attaches to the selection of such a portion of the sheet as will make a strip of a size suitable to the cavity to be filled.

In cold weather the gold adheres to the folder; this can be obviated by passing the folder over the flame of an alcohol lamp. The folder must exert no force upon the sheet except to divide it accurately in the middle, when it may be raised and folded, not patted nor smoothed with the folder, remembering always that cohesive gold must be handled as little as practicable. After the strip is folded it may be cut across its length into halves or quarters as is deemed most convenient for use; this should be done before annealing, as the swaging of a long strip will result in an irregular application of heat and a consequent lack of uniformity in the working qualities of the gold. Strips of varying sizes may be prepared for a single operation; for instance, eighths for retaining pits, quarters for lining walls and inside work, and thirds or even halves for outside contours, where no interference with its manipulation occurs and where heavier blows may be used in its condensation. Experience has demonstrated that gold will keep better in the books protected by the envelope than if left exposed in box, case, or drawer; it is therefore desirable that only such quantity be prepared as is to be used in a given operation, and that supplies be prepared first for each case.

Instead of this method some operators prefer to fold the whole sheet or even two sheets together, from this cutting strips of the needed size. This is not so convenient, as the whole sheet is unwieldy, and cutting gold across the folds incloses a greater amount of air in them than occurs when folding takes place after the cutting. The latter method may seem more expeditious, but if the assistant be trained to do the folding according to the views of the operator, this advantage is of little importance. There is always a disadvantage in cutting with the scissors several folds of gold at once, as cohesion is effected when the blades of the scissors force the leaves together, and a rigid band or border to the strip is formed, contributing to make the gold intractable and less uniform in working properties. Of course it is not intended to convey the idea that success is impossible with this style of prepared gold, but in handling a material which requires such care and cleverness, particularities and minor advantages are worthy of careful consideration.

To those who are wedded to any one manner of preparing foil for filling, it is not expected that other methods, however well recommended, will appeal; but to those who have been indifferent in selection of method, or who have not become attached to any, the first plan of preparing gold will exhibit advantages not possessed by any other except strips of rolled gold.

Probably greater density can be secured with rolled gold than with any other form; though there are some advantages in being able to prepare just such a thickness as may be required at the time. It is very popular, and has a wide field of usefulness; its condensed and compact form may have slightly less adaptability than the thinner sheet folded or rolled into a pellet, but certainly for finishing and surface work it is superior to all other forms of gold. No preparation of this foil is required except to cut it into strips of suitable size before annealing.

Preparation of non-cohesive gold. The strip is prepared as described for cohe-

sive gold. The mat, block, and pellet are made from these strips as required, their size depending upon the number of thicknesses in the strip and the width of the strip. The mat is made by clipping small crosswise sections of the tape or strip; where greater bulk is desired, the block is formed by folding the strip upon itself transversely. Cylinders may be made by rolling a strip of suitable width and thickness upon a smooth three-sided broach or a small round plugger. Many operators prefer to prepare their own cylinders, as judgment determines exactly what sizes will give greatest facility to the introduction of the gold into the cavity to be filled; the manufacturers, however, supply these cylinders in a variety of sizes. It has been stated before that the deterioration of gold is less, when kept between the leaves of the paper book, than when jumbled together in pellet form and kept in boxes or gold drawer. It is, of course, a convenience to have at hand a variety of forms, ready prepared, which may be used in an emergency; but as success with non-cohesive gold depends upon the mechanical arrangement of the separate layers, pellets, or cylinders, it is as necessary that the size of these shall have a nice relation to the size of the cavity; on this account it is often best to make a separate preparation for each operation.

ANNEALING GOLD.

Cohesive gold, when procured from the dealer, has usually a greater or less degree of cohesion, dependent upon the time which has elapsed since its manufacture and the protection it has received. It has in addition a softness given to it by the annealing process which it underwent after it was hammered or beaten into thin and rigid sheets; but this softness also has suffered deterioration in proportion to the amount and character of handling and traveling which the foil has undergone. To restore it to its most acceptable condition, therefore, both as to cohesion and softness, it is essential to re-anneal it just prior to its introduction into the cavity.

So important is it that the cohesive quality be taken advantage of at the immediate time of its greatest development, that it is advised to anneal only a very small quantity of gold at a time. If strips are used, they should be carried from the lamp to the filling; if pellets or mats are employed, a few only should be annealed at a time.

The flame from an alcohol lamp gives the best source of heat for the annealing of gold. The alcohol must be of the best quality, free from impurities and adulterations. Wood alcohol is unfit for the purpose. The lamp must be kept clean; and the wick, made of such material as will rest loosely in the neck of the burner and allow a free vent of the fluid, must be free from carbon; the flame should be colorless. With these conditions there is no objection to passing the gold directly through the flame. When attention is not given to these details, or when a Bunsen burner is to be used as the source of heat, the gold should be annealed on a strip of mica held in a frame made of light wire. The frame may be made double, so that the mica can be slipped between the divisions, and held by contact, the force being exerted by a spring in the handle. These sheets of mica may be renewed at will, or removed, cleaned, and returned. Divisions may be made by extending wire across the frame; this will prevent the accidental cohering of pellets or small portions of gold to each other.

An apparatus has been suggested for annealing gold by electricity, and where the luxury of street current is enjoyed it can be used to advantage; but when the storage battery is used, heating is more difficult and uses the current very rapidly. If the strip is carried through the flame of the alcohol lamp in the pliers, it must be remembered that the point covered by the steel is not so well annealed, it is therefore wise to change the position of the pliers and re-anneal that portion. It is quite possible to overdo the annealing, and gold which crumples up under the flame should be discarded as unfit for use in contouring; the neglect of this precaution may explain some fail-

ures otherwise difficult to account for. In many cases it is only necessary to pass the gold quickly through the apex of the flame or just above it, to develop intense cohesion; in no case is it desirable that the gold should more than glow slightly with heat. Experience with separate books of gold, or gold of different makes, will prove the amount of annealing which is needed to develop the best working qualities.

As far as practicable it is desirable that division of the gold with the scissors should not occur after annealing. This does not obtain to the same extent with rolled gold with single thickness, though on general principles manipulation of any form of cohesive gold subsequent to annealing is a disadvantage.

Gold which is to be used in the initial stage of a filling, such as retaining pit or groove, especially when the cavity has a retentive shape, should not be annealed as much as that which is used in the body of the filling—experience having demonstrated that the gold fully annealed is more difficult to introduce into a small pit than that in which the cohesive quality is less highly excited. It may be noticed that a thin strip of gold which grasped by the pliers near the center will fold double by its own weight prior to annealing, will after annealing bear its own weight perfectly; a quality of stiffness or rigidity has been developed by the process which materially adds to the difficulty of its management in close quarters; then, again, it is extending at a thousand points intense attraction for like particles, which makes it difficult to move it on to the point designed. Nevertheless, where retentive shape does not exist in the cavity and reliance is placed on the pit or groove for retention of the stopping, the gold should be extra-cohesive from the start, and used in very thin and small pieces. It is perhaps only necessary to say, in addition to the above, that in the process of annealing, as in every step in the handling of this material, it should not be entrusted to a novice; that it must be intelligently done, and with a view to fitting each piece for immediate requirements. For

the reasons given it can be done best by the operator himself, and next and by no means badly by the well-trained assistant who by long association and a process of telepathy has developed the knack of knowing what the operator desires.

METHODS AND FORCES EMPLOYED IN PACKING GOLD.

When a piece of gold foil is introduced into a relatively large cavity and with a small pointed instrument is carried with force against one of the walls, the layers of foil between the instrument and the cavity wall are condensed upon themselves in proportion to the amount of force employed. When this force is removed, however, it will be seen that nothing more is accomplished, as the area of adaptation is limited to the point of contact, and the gold remains in position only so long as it is supported by the instrument. Removing the instrument to another location and repeating the application of force until the whole surface of the foil has been covered, we perceive that a crumpled and irregular mass of gold has resulted, which, with every application of the instrument, has grown less and less like the cavity surface against which effort was made to condense it. If, however, a piece of gold be selected of sufficient size to cover one wall of the cavity and of the requisite thickness to retain its continuity under the treatment, after carrying it lightly to position we may force upon its whole surface a ball of spunk, bibulous paper, or soft rubber, backed up by a large instrument; it will then be discovered, upon the removal of the instrument and intermediary, that an adaptation limited by the diffusion of pressure, but more or less perfect, has resulted; then, if some retentive shape exist in this portion of the cavity, the piece of gold becomes permanently fixed.

It will thus be seen, first, that there is a necessity, in the use of gold for filling, for a nice relation between the dimensions of the cavity, the instrument employed, and the size of the piece of foil used; second, that gold possesses

qualities which enable it to be adapted to cavity walls, but that this adaptation must be progressively accomplished from a fixed point. In the first experiment, if the gold covered by the primary impact of the instrument had remained fixed, and the repeated applications upon the other portions of surface had produced the same effect, a successful operation would have been easily accomplished by this means and the relation of instruments and forces would have diminished in importance. Gold, however, possesses no affinity for tooth-structure, and skill and cleverness are required to contrive its adaptation and fixation.

While the objects sought to be accomplished are the same, or nearly the same, in the use of all forms of gold, the physical differences are so great, and as a consequence such different methods and forces are employed in the use of cohesive and of non-cohesive gold, that it is considered essential that separate mention be made of the principles governing their use and the methods of their manipulation.

In using cohesive gold the first essential is the point of fixation or anchorage. As has been previously indicated, this gold by handling or manipulation loses its desirable qualities as an adaptable material for sealing and stopping cavities; that is to say, in introducing a given piece of this foil it must go without obstruction to the point where it is to be condensed, and from the first contact of the instrument it must be carried to place without any subsequent movement of the portion so attached; gold on once being condensed is no longer pliable or adaptable. Cohesiveness in gold foil, as a feature of its manipulation, is such a manifested quality, and attention to this property is so absorbing, that other considerations are neglected. While its successful use depends upon the existence of conditions favoring or giving full opportunity for the expression of the cohesion, the operator should certainly bear in mind the prime object of the operation, viz, the adaptation of the material to the walls of the cavity so as to seal them faultlessly.

The point of fixation being secured in a pit or retentive groove, it becomes a matter of the first importance that the gold be extended over the surface of the cavity wall to a point where shape or angle will admit of two antagonizing retentive forces being established in opposite angles of the cavity; or where general shape will give additional security to the point of anchorage. The filling of a retaining pit is best accomplished with a lighter preparation of the gold; but when union between two pits is to be accomplished, or where extension from one pit to an angle is desirable, a heavier form is required; and this is not to be completely condensed until firmly attached to the points of fixation. This attachment may be strengthened by welding additional masses of gold over the points of anchorage; the intervening part being condensed through the addition of still other masses, until a union is made between the two points.

Where one point of fixation alone is used the extension must be most gradual and the gold be condensed only upon gold; that is, wherever the gold extends beyond the point of fixation it should be merely pressed to place, not driven. As subsequent pieces cover it, it must be condensed from the starting-point toward the limit of gold surface, leaving a rim of uncondensed gold on the outside. Under no circumstances should extension of the gold be made to the marginal side of the cavity until a bulk of it is welded into a mass in the inner portion; and then the pieces covering the margin should be extended a little at a time, building always from the portion securely anchored, and strengthening the union of the part extended to the fixed part by an additional layer of the material.

With these precautions, not only is the gold adapted to the margins, but the additional cushion between the cavity margin and the instrument precludes the danger of accident to the enamel from this source.

The successful adaptation of the gold to the walls parallel to the line of force, as for instance the buccal and lingual

walls of a bicuspid approximal cavity, can best be accomplished by observing a rule laid down by Dr. Black, above referred to: "In building up to a cavity wall and marginal edge where the line of force is parallel with or inclined toward the wall and edge, as is generally the case with the buccal and lingual walls and marginal lines of the bicuspids and molars, lay on the mass of gold and begin condensing in the interior of the cavity, then move step by step toward the wall until it is reached, and condense last against the bevel of the marginal edge." By this mode of procedure the act of condensing and wedging against the wall and edge is accomplished in a way that will make water-tight margins.

The ideal conditions favorable to the introduction of a dense mass of cohesive gold into a cavity are that the gold shall be so related that absolute contact may be obtained at all points, and that the separate pieces be brought together or welded by some form of force. The softness of gold in bulk as compared to tooth-structure would indicate that in positions where the force of mastication is to be borne by gold fillings it is impossible to attain to such a degree of density as would be undesirable for the purpose. The densest gold fillings will show signs of surface flow or wear, where contact has not been evenly adjusted, and a single cusp of enamel has been allowed to arrest the bite at such a point, showing that the metal itself is not so hard as to be capable of over-condensation. Indeed, combinations of gold with other metals to increase its hardness are often necessary under certain conditions. The objections to the maximum degree of density are the discomfort and danger attaching to its accomplishment, and its conductivity.

The difficulties encountered in the attainment of this end are due to corrugations or irregularities of the mass, accumulation of air-spaces in the preparation of the gold, accidental adhesions and irregularity of adaptation; to overcome these a greater amount of force may be required than can be used. Other things

being equal, a greater amount of density can be secured with thin rolled gold, used in small pieces; the heavier the strip, the more force required to condense it. The management of these strips in the cavity so as to avoid irregularity of attachment, and bring the whole mass up to completion without pits or holes, will tax the skill of the operator; though a near approach to this is accomplished by most, and should be expected of all.

The placement of the gold, the manner of feeding it into the cavity, and the management of the particles, as they are added, should receive the closest attention; for whether done by one system or another, the same general results are essential for success. Confusion in arrangement and lack of system in effecting relations invite disaster. The gold must be handled lightly with pliers, and where strips are used one extremity should be attached to the fixed gold or point of fixation, so that, as it is folded and refolded, the attachment of the extremity has been made with relation to the direction of these foldings. In the course of the operation the folds must extend with all the regularity practicable from one limit of the cavity to the other, always keeping the margins slightly in advance of the center, thus preserving a

general concavity of form. Where low places have unintentionally occurred, short folds and refolds may be filled in.

It is very often wise to resort to a change of preparation of gold to suit developing conditions; as, for instance, the use of a small pellet to recover a neglected angle or fill in a low place; or a heavy piece of rolled gold to connect occlusal and approximal extensions in composite cavities.

The effort to condense by an undue amount of force gold which has been badly placed can never result in as dense a filling as where the material has been properly introduced and condensed with a force which is moderate in degree but regular and precise in its application. The increase of force may effect a condensation, but, aside from the risk to the pericementum and cavity walls, there is a loss of cohesion in the surface part so condensed, making it more difficult to build on. As cohesion is a most important factor in the use of gold as a filling material, any lessening of its power is a decided loss; this is an argument against gold of extra thickness, as the force employed in its manipulation must be increased with the additional weight, and the expression of this force on the surface to some extent deprives the surface of cohesion.

THE ASEPTIC SUPERIORITY OF THE PIN CROWN OVER THE BAND CROWN.

By JOSEPH HEAD, M.D., D.D.S., Philadelphia, Pa.

(Read before the New York State Dental Society at its annual meeting, Albany, May 13, 1904.)

IN these days of asepsis many appliances that have passed unchallenged for years are open to questioning scrutiny. Any mechanism that causes infection or irritation of the tissue around the necks of the teeth must be regarded as a menace to the health of the entire mouth. Years ago, when Miller

demonstrated what dental decay was, when he made his experiments on the efficiency of mouth-washes, when he demonstrated the presence of dangers arising from bacterial plaques around the necks and between the teeth, he presented to the world modern prophylaxis. And in doing this he made it obligatory

for all scientific dentists to see to it that appliances, through their filth-collecting proclivities, shall not be a source of greater harm than benefit.

However much our theories concerning pyorrhea may differ, no one will deny that irritation or infection around the necks of the teeth is of prime importance in its origin; and there is no one who believes that pyorrhea can be cured until all sources of irritation and infection from around the teeth have been removed. Among such sources of infection and irritation the band crown appears in aggressive prominence. Theoretically the band at the neck of the tooth can be made almost smooth with the contour of the tooth. But is this so practically? Can the most expert den trim a root and fit a band under the gum and be sure that the sharp edge of metal does not project enough to cause irritation and consequent infection every time the tooth springs under the impact of mastication? If this doubt be present with the most expert, how surely must it be present with the average operator! In answer to this, let us all recollect the ill-fitting bands we have deprecatingly observed on the crowns made by other dentists; let us even remember the crowns made by ourselves—that we thought beautifully fitted; that subsequent events made us examine out of the mouth, and made us wish that someone else had made that crown.

The fitting of a band to the neck of the root under the gum can be likened to the well-known game of drawing a pig on paper with the eyes closed. The general outline of the pig can be drawn with fair accuracy, but the characteristic details are just as hard to get, and as frequently lacking, as are the fine indentations and curves of the root. Yet, in spite of all these serious objections, no experienced operator will say that the band crown should never be used. In bridge work or in fractured or badly decayed roots it fills a want that can hardly be filled by any other device. But when we use it let us recognize its dangers as well as its advantages; let us admit that the best-fitting band forms a

ledge under the gum that may prove a source of lodgment for infection, and that the seriousness of this danger will depend entirely upon how cleanly are the habits of the patient, and how prone the oral tissues are to contamination. If, then, it be admitted that the band *per se* has serious objections, it is incumbent upon us to avoid its use in all crowns wherever sufficiently good anchorage can be obtained to obviate the danger either of the loosening of the cement or the fracturing of the root.

This anchorage with the ordinary pin crown can now be obtained in every instance where the root is solid and not decayed below the neck of the gum. If in upper centrals, laterals, and canines the face of the root be formed wedge-shaped, as shown in Fig. 1, with the

FIG. 1.



FIG. 2.



notch on the lingual aspect so as to support the front wall of the root against fractures, crowns perfectly adapted will readily bear all the strain that can be brought against them and yet have no overhanging edge to irritate the gum. With all bicuspid, upper and lower, and all lower incisors and canines, the head of the tooth should be in the form of a simple wedge, as shown in Fig. 2, so that lateral pressure on the sides shall be supported by the entire root. This easy method of forming the head of the root can be used also in the upper centrals and canines, but the notch, as before described, has in these instances given the best results.

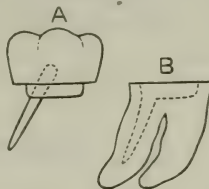
This method of conforming both porcelain-faced metal pin crowns and all-porcelain crowns to the heads of roots has been so often described that it needs no further description here; let us pro-

ceed, therefore, to show how molar pin crowns can be made of sufficient strength and stability to avoid the necessity of the band.

The face of a molar root ordinarily cannot be efficiently formed into a simple wedge, as in bicuspids or front teeth, for the planes would be so long and the bite so short as to impair the strength of the crown, and therefore the following device is substituted: The cavity of the pulp-chamber of a molar is just level with the gum margin. The head of the root should be ground flat and smooth. The pulp-chamber should be enlarged and formed into a deep cavity suitable for forming an inlay; the posterior root-canal should also be enlarged as far as may be safely done for the admission of the pin of the porcelain crown. When this has been done, insert and fit a platinum pin as far into the root-canal as possible. Then remove the pin and burnish and swage into the pulp-canal chamber, and over the head of the root inlay platinum foil until a perfect matrix is obtained. Then punch the platinum pin through it, well down into the posterior canal, and fasten the foil and pin together with hard wax. These should be withdrawn from the mouth and invested and soldered together either with gold or platinum solder. They should then be replaced in the tooth and reburnished to make sure of perfect adaptation. Porcelain the color desired for the tooth should be fused within the matrix of the pulp wall, around the pin and over near to the edges of the root margin, leaving the platinum near the margins free from porcelain, to allow of a final adaptation before the last fusing of the crown is completed. When this has been done the matrix and pin can be placed in the tooth and an impression taken in which the porcelain-filled platinum can be removed. Wax should be flowed over the pin and under the side of the matrix to permit of easy removal, and the model run into the impression with the pin and matrix in place. When the model is obtained, a slight amount of heat applied to the platinum matrix and pin will permit of its easy removal, when the pin can be cut

off the proper length and the crown built up according to the necessities of color and bite. Fig. 3, A and B, will show the finished crown and the outlines of the cavity in the prepared root.

FIG. 3.



Carved crowns are frequently most artistic, but they lack the strength of porcelain that has been formed in a mold under pressure. For that reason it is usually better to use a manufactured tooth. This can be ground and fused into position with porcelain as desired. Before the edges of the platinum matrix are covered by the last fusing, it will be frequently advisable to burnish them finally on the edges of the root in the mouth to be sure of perfect adaptation. Before the tooth is set, the platinum matrix can be removed, when the pin can be roughened, and the porcelain plug that fits into the pulp-chamber undercut. Then the canal and pulp-chamber can be undercut, and the tooth cemented into place in the ordinary manner. The chief support of this molar crown lies not in the pin, but in the inlay of porcelain that fills the pulp-chamber. If two pins are deemed advisable they can be used, if not too long and if the pulpal openings of the canals are sufficiently enlarged to make it possible to overcome the divergence of the canals when the pins are being withdrawn.

If it be desired to make these molar crowns without the use of a model, the following method can be employed: When the matrix and pin are stiffened with porcelain as herein described, a rubber countersunk tooth of the proper size and color should be ground to fit the head of the root and the bite. The pins of the porcelain tooth should be cut away, and its cavity filled with porcelain paste. This can then be placed into its

proper position on the platinum matrix and fused—being careful, as before stated, to leave the platinum edges free for final burnishing and finishing.

Cement should always be used in setting these pin crowns, because gutta-percha has not sufficient rigidity to prevent a possible slight withdrawal of the pin, and the chief strength of these

crowns lies in the perfect adaptation to the head of the root, and in the tensile strength that is present and always exerted in the pin so long as it is held firmly in the canal without room for lateral bending. Gutta-percha, also, when exposed at the neck of the tooth is apt to become spongy and a collector of infection that is most objectionable.

REMOVABLE BAR FIXTURES.

By CHARLES SOUTHWELL, D.D.S., Milwaukee, Wis.

THE fixtures herein featured were exhibited, in February 1903, at the celebration of the fifteenth anniversary of the Odontographic Society of Chicago. Every case is a practical one, having been available for the clinic through the courtesy of the patients for whom they were made and by whom they are being worn; and they are offered as suggestions toward the avoidance of the pestilential bridge and noisome plate. The claims for this class of service are—

- (1) Avoidance of the display of gold as in bridge work.
- (2) Cleanliness.
- (3) Avoidance of bulk or spread of material as in plate work.
- (4) Avoidance of gingival disturbance often following the introduction of partial vulcanite dentures.
- (5) Minimum covering of the tissues.
- (6) Permission of porcelain masticating surfaces.

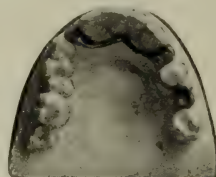
The history of these cases began with case No. VII, made in December 1892, and ends with case No. XI, which was under construction at the time of the clinic.

CASE NO. VII.

Miss B., ætat. twenty-four. (Fixture made in 1892: Fig. 1.) The natural teeth in this case are beyond the average in length—providing, therefore, long

spaces. The spaces are also at variance in their direction, and the success of the fixture is to be credited largely to these two features. The construction is very simple. A band of medium width and fairly close adaptation encircles the up-

FIG. 1.



per left second bicuspid. An oval gold wire, conformed by pliers only, extends from said bicuspid through the rugæ to the space made by the missing lateral. The band and wire were assembled in the mouth and removed in an impression for soldering. No clasps or lugs of any kind were used at any point. Close adaptation, long keying divergence of the spaces, and the band, are the only means of retention. The lateral, bicuspid, and molar substitutes were conditioned as for bridge work, and the assembling of the parts for soldering was done in the mouth.

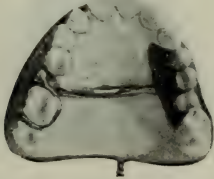
After twelve years of uninterrupted service this fixture leaves nothing to be desired. The band has not affected the bicuspid, but it is to be admitted that the

patient has been punctilious in removing the fixture both at night and during the day as often as necessary for cleanliness. The oval gold wire has dictated a comfortable seat in the tissues, and is no more apparent than exaggerated rugæ. The marked success of this experiment led to quite a number of similar cases, some of which, for varying reasons, were not available for the clinic.

CASE NO. III.

Mrs. S., ætat. forty-five. (Fixture made in 1900: Fig. 2.) This is one of

FIG. 2.



those quite frequent cases where banding the left canine for bridge work would have been reprehensible, and the appliance may be considered an unqualified success in every respect. The construction is about as follows:

On the right of the upper jaw the narrow band which encircles the first molar at its corona was reinforced or thickened with solder after reasonably close adaptation. The bar which extends across the roof of the mouth was made by first swaging a thin narrow strip of plate or pure gold. Half-flat gold wire was shaped to this by pliers and the interspace between the wire and swaged plate filled with solder. This and the band were next assembled in the mouth, removed, soldered, and replaced in the mouth.

A bar of platinoid was next fitted quite close to the gum, extending along the ridge between the canine and the molar. These parts were removed in their proper relationship, and the platinoid bar was soldered to the gold bar. The single narrow tooth on the right occupying the space between the first bicuspid and the first molar was conditioned as for bridge work. Those on the left are

ordinary vulcanite teeth, and (after being articulated) at the time the one on the right was soldered to the band, the pins of those on the left were soldered to the platinoid bar. A bulk of soft gutta-percha (enough to take the impression of the left space) was molded upon the left end of the fixture, beneath the teeth, and after being reheated the whole fixture was crowded into place with the lower teeth. At such a juncture the case may be removed and all excess of soft gutta-percha removed. When this has been done the case may be reheated and placed in the mouth to correct the impression.

The next step was the vulcanizing of rubber to take the place of the gutta-percha. Notwithstanding the above cautious procedure the fixture was not a marked success, and a few weeks later a bit of rubber equal in bulk to a drop of ink, vulcanized beneath and approximately about the single tooth on the right, seemed to work wonders.

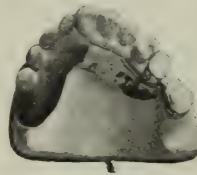
Recent reports on this fixture are of a most flattering nature.

CASE NO. V.

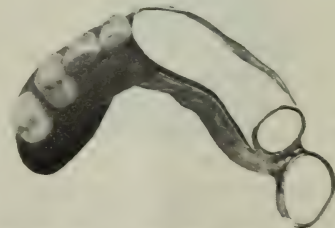
Mrs. W., ætat. fifty. (Fixture made in 1901: Fig 3, *a* and *b*.) This denture

FIG. 3.

a



b



is so unusual that two illustrations are offered. It will be noted that there are

no natural teeth on the right side of the upper jaw forward to the right central. Some recession at the right of the central discloses about one-fourth of the root, and the tooth, while slightly loose, was otherwise promising. A slight space, due to a loss of the left first molar, exists between the second bicuspid and the second molar. Bridge work was out of the question, and a plate constructed upon usual lines promised failure. A special feature of the fixture here shown lies in the broad, thin, plate-like band that embraces the gum or ridge containing the five contiguous teeth.

The outer plate of this band extends across the front of the ridge, joining the inner portion of the band at the right of the right central and to the rear of the second bicuspid. The construction of this fixture is about as follows:

Bands as described were fitted at the coronal portion of the bicuspid and molar. The plate-like band which surrounds the ridge containing the five contiguous teeth was made in one piece by slicing the teeth and some of the ridge from the plaster cast, which when reproduced in zinc made a mound over all of which thin pure gold was swaged. The portion of this swaged plate covering the ridge previously occupied by the teeth was cut out so that it could slip readily over the teeth in the mouth. This gold, being thin and soft, was further swaged and adapted in the mouth with the rubber end of a pencil, by "walking" or turning a large hand bur along the edges and by finger manipulation. It was next reinforced by a small stiff wire that was soldered to and extended around its greatest edge. After being again tried in the mouth it was further stiffened by flowing a high grade solder liberally over its surface. This and the bands were again assembled in the mouth, and removed and soldered in that relationship. Two gaffs of platinoid were next soldered on the right of the plate where it crossed the ridge, extending somewhat parallel to each other and to the ridge, and to these the articulated teeth—in this case a small section of continuous gum—were next attached by

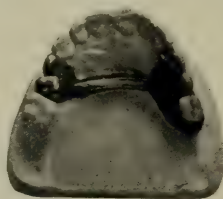
merely soldering the pins to the platinoid bar. After a soft gutta-percha impression beneath the teeth, as described in case No. III, the fixture was completed with pink vulcanite.

While the lip is of average length, the outer plate of gold is not exposed to view. The appreciation of the patient may be said to be almost effusive.

CASE NO. X.

Miss M., ætat. forty-five. (Fixture made in 1901: Fig. 4.) The teeth sup-

FIG. 4.

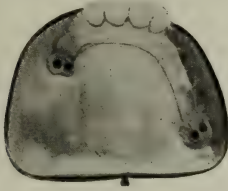


plied in this case were an upper right first bicuspid and two bicuspid and a molar on the left. A gold crown encases a much alloyed second bicuspid on the right. A large cavity on the distal surface of the left canine, involving the pulp, favored the introduction of a round platinum pin firmed by a large filling of standard alloy. This pin, bent at a right angle, projects three-sixteenths of an inch toward the line of the ridge and enters a tube soldered to the bar. The bar extending across the roof of the mouth was constructed as described, and a platinoid bar was attached on the left parallel to the ridge. Vulcanite teeth, after being articulated, were tacked firmly with solder to the bar, and the case was finished by replacing a soft gutta-percha impression with pink rubber in the manner already described. The place and direction for the tube was determined by replacing the bar, crown, and platinoid bar—previously united—in the mouth. The tube was then slipped on the pin and stuck to the bar with a fixative in the proper relationship, then removed and soldered. This pin endures no stress whatever. Its office is merely that of preventing the sagging of the fixture.

CASE NO. VIII.

Miss M., ætat. forty-three. (Fixture made in 1902: Fig. 5.) This mouth

FIG. 5.



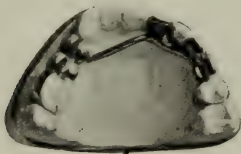
contained an upper right bicuspid, four incisors, and a molar on the extreme left. The teeth supplied were a bicuspid and canine on the right and a canine, two bicuspid, and a molar on the left. This case was promised for the clinic, and the cast shown is the one on which it was to be mounted. She decided at the last hour that the fixture could not be spared.

The construction is simple. Bands as described were fitted to the bicuspid and molar. A narrow strip of thin gold was swaged, extending from the bicuspid to the molar, as is discernible by the imprint in the cast. To this a half-flat bar was adapted by pliers and the interspace was filled with solder as described. The teeth substituted were conditioned as for bridge work and soldered to the bar. No vulcanite was used in this case, which is giving perfect satisfaction, having for a distinguishing feature a very creditable appearance in the mouth.

CASE NO. IV.

Mr. S., ætat. forty-two. (Fixture made in 1899: Fig. 6.) This fixture

FIG. 6.



supplies two upper right bicuspid, the left central, canine, and first bicuspid.

The construction of this case is similar

to that of case No. III. Reinforced bands encircle the right first molar and the left second bicuspid at the corona. The bar extends from the right first bicuspid to the left first bicuspid and was not soldered to a swaged foundation, as I now recall the case. The substitute teeth were conditioned as for bridge work. It may be noted that the bands are quite remote and that a blight of gold has not been imposed on the anterior teeth. A vulcanite lining was not required.

While this case has met all requirements perfectly, a similar one made about the same time for a naval officer had an "otherwise *denouement*." The construction and extent of his case was practically the same as in case No. IV, but it developed that he was called away too soon after the fixture was made. I did not learn of the failure until I wrote for a photograph of the fixture for the clinic. His pointed reply left nothing for conjecture. I then gave very minute instructions for a vulcanite lining, but from his next reply inferred that the fixture was beyond recovery, having been long since consigned to gehenna.

Experience leads me to state that a vulcanite adaptation beneath the teeth would have made this fixture serviceable beyond all doubt.

CASE NO. VI.

Mrs. K., ætat. fifty-eight. (Fixture made in 1902: Fig. 7.) This patient's

FIG. 7.



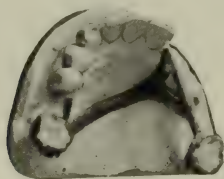
mouth, as may be seen, contains only the six anterior teeth and in some respects resembles case No. V. Deciding that an ordinary denture might not prove satisfactory, a plate—as in case No. V—was

swaged to embrace or encircle the ridge containing the natural teeth. The adaptation was further perfected in the mouth by the means described in case No. V, and was stiffened with a wire along the greatest edge and solder over the surface. Platinoid gaffs extend on both sides of the mouth along the ridge to which the pins of the articulated vulcanite teeth were soldered. A soft gutta-percha impression replaced by pink rubber as described completed the case, and the appliance is being worn with perfect satisfaction. The outer plate which extends across the ridge is not in view in the illustration. To this feature may be credited the fact that the plate does not sag or drop perceptibly.

CASE NO. XI.

Mrs. E., ætat. forty-five. (Fixture made in 1902: Fig. 8.) Bands as de-

FIG. 8.



scribed encircle the upper second molars, both the right and the left. The construction is as revealed in the illustration. A bicuspid fills the interspace on the right and a proper complement of vulcanite teeth occupies the space on the left, the pins of which were soldered to the small bar of platinoid on the right and the longer one on the left. The patient has worn a fixed piece of bridge work on the left for many years, and in speaking of the present fixture said, "I don't think I like it quite as well as the bridge work." Bridge work on the left is contra-indicated, and the cleanly and

artistic feature of the present case may not fully appeal to her.

REMARKS.

It has not been my habit to advise this work to all patients indiscriminately. The character and environment of the natural teeth and the established prophylactic habit have ruled the selection of patients, and in each instance where bands involve natural teeth the patients have been acquainted with the untoward possibilities and obligated to the removal of the fixture at night as well as to the rigid observance of cleanliness.

These fixtures were exhibited at the clinic and are presented here for consideration only; they are not urged upon any reader.

The claims for this class of service should be apparent, and nothing is especially urged except possibly the esthetic aspect. It is reasonable to presume that, ordinarily, cases Nos. III, IV, VII, VIII, and XI would have been met by bridge work, in which event out of fourteen abutments eight would have been mutilated and six excised for a crown or disfigured by a band. By introducing removable bar work in the cases cited, the bands, eight in number, were not only placed on remote teeth but were also placed at the corona, thus avoiding the usual mutilation.

It is to be noted that in five of these cases no gold is exhibited on the masticating ends of the substitutes, and that no bands with mutilating prerequisites or disintegrating tendencies are placed on the anterior teeth. The individual parts in the make-up of this class of dentures must be assembled *in the mouth*—for the use of an articulator will insure a failure. Where the natural teeth are short and the spaces lack keying divergence, complete satisfaction is not likely to follow.

PORCELAIN ART IN DENTISTRY.

By HERBERT L. WHEELER, D.D.S., New York, N. Y.

(Read before the New Haven Dental Association, at its first annual convention, New Haven, Conn., March 15, 1904.)

PORCELAIN art in the realm of operative dentistry probably began with the operation of Dr. A. J. Volek of Baltimore, which consisted of grinding a piece of already baked porcelain to approximately fit the cavity, and setting it as an inlay by packing gold around between the porcelain and the cavity margins. This method is first described by him in the *American Journal of Dental Science* for July 1857, wherein he credits the suggestion to Professor Maynard of Washington.

This plan has been employed, in cases where the operator has had the skill and patience to grind a piece of porcelain to an accurate fit, down to the present time, though oxyphosphate cement has been substituted for the gold in fastening the inlay.

I have seen, within two years, a beautiful specimen of this work, in which a broken tip of a central incisor had been restored by Dr. J. Morgan Howe, twenty or more years ago, and the porcelain and its fastenings were still in perfect condition. This tip was made from an Ash & Sons tooth. One advantage in using porcelain already baked is that in all probability it has been more scientifically handled and annealed by the expert workman employed by the manufacturer than modern inlays are by the average dentist; hence it is likely to be of superior texture and strength, and, if accurately fitted, will undoubtedly do as good or better service than many of the inlays baked by inexperienced men in the profession today. Its great drawbacks are difficulty of getting a perfect fit and the length of time required for the operation.

The present method of making porce-

lain inlays to fit the cavity by means of fusing porcelain, glass, etc., in platinum or gold matrices which have been previously made to fit the cavity by pressure and burnishing, was originated by Dr. Wm. Rollins of Boston, and first described by him in a paper read before the Society of Oral Science in June 1880. Dr. Rollins was also the first to use gas furnaces for baking porcelain, and his ideas seem to have been seized upon by Dr. Land and patented as original.*

In speaking upon the history of inlays in my paper on porcelain read before the New York Institute of Stomatology last year, and published in the May 1903 *International Dental Journal*, I relied somewhat upon an article written by Dr. Bruck, which was translated by Dr. Jenkins and published in the *Items of Interest* in 1892, which purported to be a history of porcelain inlays. I regret very much having done this, as I find upon further research that the account is very inaccurate, and I take this opportunity to correct my mistake in my former paper on this subject.

INGREDIENTS OF PORCELAIN BODIES.

Chemically speaking, the high and low-fusing materials are the same, the difference between them being one of proportions in the ingredients rather than of dissimilarity in the materials, except that all of the low-fusing bodies contain artificial flux, which greatly increases the soluble elements in the body. The probabilities are that the Jenkins low-fusing body has been

* See *Independent Practitioner* for June 1888.

changed several times, but despite this fact it is, I think, a glass, though it has been claimed that it is made by the ingenious mixture of several feldspars. That it is composed,—if this be so,—of different feldspars whose chemical formulæ may vary slightly because of different proportions of potassium or sodium, does not change the fact that the entire body is fusible, save perhaps a very small proportion of kaolin, which, so far as I can see, does not add to the strength or quality of the material, and greatly increases its shrinking capacity. It is not impossible that a body made in this way, though it be low-fusing and a glass rather than a true porcelain, may, if properly annealed in the cooling process, make a very strong substance. Its weakest point lies in the possibility of its being eventually affected by the fluids of the mouth, owing to the large amount of soluble salts, such as potassium, sodium, or magnesium, used to lower the fusing-point.

The high-fusing materials differ from this in that they contain a greater or less proportion of silica, which is infusible under ordinary circumstances, but may become fusible at a high heat, through grinding too fine or through adding too large a proportion of the highly alkaline constituents.

All of the high-fusing bodies, so far as I have observed, are true porcelains, containing a sufficient quantity of silica, along with the feldspar and kaolin in their make-up, to give stability and strength to the material.

The greater the proportion of silica, so long as there is enough feldspar to bind the particles closely together, the higher the fusing-point, and if proper care be used in cooling, the greater the strength of the material. Both for the purpose of producing proper form in lost tooth-structure and for obtaining strength, I consider the high-fusing material much superior to the low-fusing.

I do not agree with some writers who favor high-fusing material, that the better breaking up of the rays of light by the high-fusing body in all cases produces a more natural-looking material.

The higher-fusing the body used, the more stable the colors and the less danger of bubbling. These advantages are due to the lessened amount of alkaline material contained in the high-fusing bodies.

STRENGTH OF INLAY PORCELAINS.

From some practical experiments which I have made, with the expenditure of much time and patience, I am inclined to the belief that the strength of the high-fusing as well as that of the low-fusing material is somewhat affected by the quality of the feldspar used in the flux, and it has occurred to me that possibly the chemical changes produced when the heat is carried to a point where the color disappears may also affect the strength of the material. A feldspar is a silicate of alumina, with silicates of other bases, either soda, potash, or calcium. These soluble alkaline portions vary considerably in different feldspathic rocks.

I have come to these conclusions from observing the tensile strength of the different inlay materials upon the market. In order to obtain the following results I made blocks of the different inlay materials about one-half inch long, three-eighths inch wide, and three-sixteenths inch thick, putting these in a machine for testing the strength of teeth.

The Jenkins material will stand an average strain of $32\frac{1}{2}$ lbs., while it will go a little higher—to $37\frac{1}{2}$ lbs.—if the material be baked so that it rounds almost to a globule and the color is lost to some extent. Ash & Sons' low-fusing stood a strain of $30\frac{1}{2}$ lbs., and their high-fusing 45 lbs., this high average being brought about by one remarkable block which stood a strain of $60\frac{1}{2}$ lbs. The Consolidated inlay material, which was originally made by Mr. Whiteley, now with the Dentists' Supply Co., averages 39 lbs., while the body now made by Mr. Whiteley averages 41 lbs., and the Brewster high-fusing enamel, in which the silica is apparently ground to extreme fineness, averages 19 lbs. The S. S. White high-fusing porcelain aver-

ages 33½ lbs. Parker's body, which is something like the following formula—Spar 4 oz, silex 3 oz, kaolin 1 dwt.—would not break, the platinum pins breaking instead. These tests, which were very carefully made by myself at different times, seem to indicate as a whole that the high-fusing, both for strength and for the obtaining of satisfactory colorings, are vastly superior to the low-fusing bodies.

FUSING-POINTS OF PORCELAINS.

Upon going over the fusing-points given us by Mr. Hammond, as published in my previous paper, I decided to make some tests with the pyrometer for myself. In these I used colored glasses in order to observe the operation of baking more closely and accurately. This plan protects the eyes from the glare of the furnace.

I obtained the following results, some of which vary from those given by Mr. Hammond. The degrees are given in the Fahrenheit scale:

Jenkins' enamel,	1552° Fahr.
Ash and Sons' low-fusing,	1580° “
Ash and Sons' high-fusing,	2084° “
Consolidated,	2084° “
Whiteley's,	2228° “
Brewster's,	2084° “
The S. S. White Co.'s	2228° “
Parker's,	2588° “

A body which Mr. Whiteley sent for me to try fused at 2264°, and held its color the best of anything in the list except Parker's. This also stood, in the tensile strength tests, an average strain of 48 lbs., and one piece refused to break, the pins breaking first.

In the matter of shrinkage, the Parker body contracted the least and showed the least tendency to warp. The shrinkage of the S. S. White and the Whiteley bodies was nearly the same, the former shrinking a little the more. This may be because of starch or gum tragacanth being put in the S. S. White body to make it work easier.

The Consolidated, the Ash & Sons' high-fusing, and Brewster's were about the same, the Consolidated shrinking a little less than the other two. Next

came Ash & Sons' low-fusing, and the greatest shrinker of all was Jenkins' enamel; this also showed the greatest tendency to change shape by warping or drawing up at the ends. It would seem that the time required to work the Jenkins' enamel successfully must be greater than any of the other enamels or porcelains, though there is doubtless some time gained by the furnace not being so highly heated to cause fusing.

The Ash & Sons' low-fusing body seems to be much nearer a true porcelain than the Jenkins' enamel. Their high-fusing body and that made by Brewster have some similar characteristics. I apprehend that the infusible silica in both these bodies is very finely ground, though the Ash material seems to be able to withstand twice the strain that Brewster's does.

These results seem to indicate that for most cases of inlay work all the materials on the market may be of sufficient strength, and that with some slight modifications the higher the fusing-point of a body the more certainty of its color withstanding the heat of baking, and the greater the possibilities of artistic work in those difficult cases where it is necessary to produce a concavo-convex surface in order to carry out a resemblance to the natural teeth.

Generally speaking, the higher the fusing-point the greater the strength, but this is materially affected by the care with which the heated porcelain is protected from changes of temperature, such as currents of air, during the cooling process, and by the rapidity with which this process is carried on.

No porcelain or glass material can be taken from a heated furnace without greatly lessening its toughness and edge strength. Still there remains this undisputed fact: The lower you get your fusing-point, the nearer you come to a glass compound rather than porcelain, and the greater the probability of the surface of the enamel being unfavorably affected by the fluids of the mouth.

Thus far the Jenkins' enamel is the only glass-like material that is still much in vogue, and from cases which I have

seen in which the color has changed and the surface become roughened after having been awhile in the mouth, I believe that due caution is not being exercised by our profession in adopting a low-fusing material before it has been demonstrated by the test of time that it is absolutely insoluble in the fluids of the mouth. It seems to me that there is no good reason why the inlay material furnished by the manufacturers should not be fully as strong and keep its color as well as the artificial teeth they produce.

AN AID IN SECURING DENSITY.

It was suggested by Dr. Littig of New York, in discussing a paper read before the New York Institute of Stomatology by Dr. Robert Moffatt last October, and published in the January *International Dental Journal*, that manufactured teeth made in molds were stronger than carved teeth because of pressure used in bringing the molds together.

By experiment I found that by a gentle tapping of the instrument which held the matrix on which was placed the

porcelain body by another instrument, and a careful absorption of the moisture by blotting paper as it comes to the surface, until no more moisture can be extracted, a much greater density is secured, and consequently less shrinkage and greater strength than when the minute particles are forced into place by pressure; thus demonstrating that, given the same material as is used for artificial teeth, a greater density and strength can be secured, the conditions of baking being the same, by bringing the particles of the porcelain body into the closest relation with each other by gentle tapping rather than pressure.

I would suggest that if you wish to do an especially strong piece of work that may be more lasting and of better shade, this might be done by securing a tooth of the required color, pulverizing it in a mortar, and baking it as an inlay. This will avoid dependence upon any particular make of body, and will doubtless prove as effective a way of obtaining the desired shade as the attempted blending of the various colors sold in an inlay set.

DENTAL EDUCATION, THE EMBODIMENT OF THE NEW EDUCATIONAL IDEAL.

By J. FREMONT BURKET, D.D.S., Kingman, Kans.

(Read before the Section on Odontology and Stomatology. Fourteenth International Congress of Medicine, Madrid, 1903.)

THE primary object of general education is the development of character.

The profession or life-work is secondary. This relation of character and life-work must obtain in the preliminary education of a dentist if dentistry is to take its place as a noble, learned profession. The education of a boy till he is eighteen or twenty years of age should advance along no other lines. The new education, rooted in its basic science of psychology, comprehends the rational unfolding of the child's threefold nature.

By "new" education is meant the present educational system as opposed to the oriental and classical systems that preceded it.

The ideal of oriental education was the training of the child for the institutions, social customs, and established usages about him. The ideal of classical education, founded upon Greek and Roman civilization, was the sacrifice of the child for the good of the state. Free and independent inquiry and development could have no place in either of

these systems. The new educational ideal, proclaimed by Pestalozzi, demonstrated by Froebel, and carried by their disciples into all the countries of western Europe and into America, is the complete unfolding of all the individual powers, mental, spiritual, and physical, and is realized in the training of the head, the heart, and the hand. Unfortunately, in nearly all countries, the new educational systems have laid undue stress upon the training of the head, leaving out almost entirely the heart, and more especially the hand. General educators are making strenuous efforts to overcome this defect by emphasizing the development of character, and by incorporating manual training in the schools.

Early training directed toward some especial profession or calling, is in accord with oriental or classical rather than modern educational ideals, since it naturally tends to develop one part of a youth's unfolding nature to the detriment of the others, and in the end is dwarfing to the individual. Technical training later on does not have this effect. Hence it must follow that dental education, *as such*, should have no place in the life of a boy before he reaches at least eighteen years of age. Previous to that time he is being trained for *life*, and the rational, symmetrical development of his threefold nature should be the aim.

These considerations would seem to indicate that about all dentists or dental commissions can do for preliminary dental education, beyond fixing the standard for entrance to the dental college, is to look into the educational systems of their respective countries, and see that the new educational ideal finds full expression in the schools.

THE NATIONAL SYSTEM OF EDUCATION IN THE UNITED STATES.

In the United States there is a national system which expresses itself in the kindergarten, the elementary schools, the high school, and the university. Not all the states have their schools brought up

to this standard as yet, but it is the model after which all are forming. It was only at the last session of its legislature that Kansas passed a bill providing for manual training in all the schools of the state, and it will be but a short time till it is embodied in the schools of all the states.

The function of the kindergarten is the "setting of the instrument," as Sir Michael Foster styles it in his Cambridge address, the starting of "habits of accuracy, intentness, and alertness." In building, constructing, and geometric drawing, the hand is trained to obey the will to some definite end. In color work and clay moldings the child not only receives manual training of a high order, but learns to *see*, and obtains power to discriminate in color and type forms, and is thus led to a right feeling for what is beautiful and eternal in art. Through plays and games he passes from nature—from things—to self-activity, from the material to the spiritual; and in the varied relations with other children there is awakened that ethical feeling that must govern social conduct. Thus there is laid in early life the foundation for the development of those ultimate powers and principles so essential in the dentist.

The kindergarten is followed by what is termed the elementary schools, a succession of schools, usually eight, sometimes nine, systematically graded, in which the boy finishes his primary education and is fitted for the high school.

Manual training in proper gradations obtains all through the elementary schools, and is continued on through the high school.

Nature studies leading to elementary science are begun in the first years of school. In the high school the learner has the sciences, in a somewhat elementary form, of botany, physiology, physics, and astronomy or zoölogy; mathematics through plain and solid geometry; general history, and English and American literature. In the languages he has, besides a critical study of English, two years of German and four years of Latin.

There are usually two courses which

are elective, in the high school: the scientific, which includes no foreign language and may be finished in three years, and the classical, which includes German and Latin and requires four years for completion.

An eminent American dentist recently remarked that the study of physics in the high school was almost useless, because not carried on by laboratory methods. I must as emphatically affirm the contrary, so far as the future dental student is concerned. When a boy has had the study of physics in preliminary education, and has become familiar with the science in this elementary form, he is prepared to enter at once into the spirit of the study in a dental school, with its laboratory opportunities. Besides, a boy with a scientific turn of mind will perform many experiments with the crude materials at hand in an improvised high-school laboratory. It may be noted that four years are given to the study of Latin, a dead language, while but two are given to German, a living language. Owing, perhaps, to the practicality of this age, there seems to be a growing sentiment against the study of Latin. This feeling has been especially emphasized by the recent decision of the new University of London that Latin is no longer compulsory on professional students. However, this decision is not to be wondered at so much when we consider the chaotic state of education in England as revealed in the debates on the recent educational bill in Parliament. With no national system of education it would seem difficult for the masses of children to successfully study Latin or any other foreign language. In the United States the schools are modeled after one system, and the pupil's progress is carefully graded from the kindergarten to the high school, so that if a boy passes from one town to another, or from one state to another, he has but to hand in his grades and he is fitted into his proper place almost without a jar in his progress. But whether the sentiment be for or against Latin, the fact remains, and will forever remain, that Latin has entered largely into the

formation of the English language, and a study of it is necessary to an independent use of English. More than this, it is the foundation of the Romance languages, the Spanish, French, Italian, and Portuguese, and if a boy has had the Latin in his public-school course, he can readily acquire any one of these languages in a short time even when in active professional practice. In this day of international affairs, when men are likely to pass from one nation to another, and a reading and writing knowledge of the language, at least, is eminently helpful, the value of Latin in early life must be apparent. A boy usually finishes the high-school course at about eighteen years of age.

PRELIMINARY REQUIREMENTS ACCORDING TO THE REPORT OF DR. ROY AT STOCKHOLM.

We will compare this course of instruction with "Preliminary education necessary for the student of dentistry," as embodied in the report of Dr. Roy, secretary-general of the International Educational Commission, and submitted to the International Dental Federation at Stockholm, and which is as follows: "(1) A literary education with a knowledge of two living languages. (2) An elementary knowledge of science. (3) Manual instruction."

We will consider the last requirement first, as it stands at the beginning of the whole structure. We have shown that manual training obtains throughout the whole course, predominating in the kindergarten, but diminishing in the higher grades as the development of the mind calls for more mental work.

This order is in accord with the proposition stated by Sir Michael Foster, that "The mind grows old very slowly and can be educated even late in life; but the body becomes old very soon and it is necessary to train it while it is really young." In general education it is based on the psychological fact that activity is the fundamental law of child-development. It is, however, just the opposite of the recommendation of Dr. Roy's report,

that "studies relating to general culture should not be prolonged beyond the age of sixteen," so that from there on the boy may have "gradual manual instruction on the one hand, and elementary scientific instruction on the other." As has been observed, while he has training leading to the normal development of his threefold nature all through the public school, manual training predominates in early life when it will produce the greatest amount of digital skill and manual dexterity. If, as leading educators declare, "Manual skill resides not in the hand, but in the brain and mind, and is, in the strictest sense of the word, a part of intellectual training," then its development should begin simultaneously with that of the mind.

The second requirement is fully met by the nature studies, followed by the general sciences named in the course of instruction.

The first requirement, "A literary education with two living languages," is more than fulfilled by the high-school course. Hence a classical high-school education in the United States more than measures up to the standard for the minimum preliminary dental education as embodied in Dr. Roy's report. Emphasis, however, should be placed on the word *minimum*. Why should young men be urged into the technical schools at a very early age if they will spend the time in studies of general culture? If a boy has had the intelligent early training that produces mental development, ethical character, and manual dexterity, has he not now reached the point where he can obtain most good from culture studies? Is not this the time to lay broad and deep the foundation upon which a purely technical education should be built? Upon the fruitfulness of these few years must depend much of his future usefulness to society and to his profession. These, too, are the years for acquiring the capacity for continuing to develop through an intelligent appreciation of art as it is expressed in music, literature, architecture, and the kindred arts; not mentioning the treasures held by the literatures

which the studies of the different languages have unlocked to him, and their power, if read at this time, to strengthen his moral purpose, enrich his life, and uplift his whole manhood. If a profession advances according to the all-round scholarly students who enter its ranks, it is men of such character and attainments who will carry dentistry to its destined high place among the learned professions. Then why not encourage university education for the student, as in dentistry the university man will find full scope for the exercise of his trained powers.

The trained hand is beginning to receive true recognition in the making of complete manhood. It was the want of this recognition that caused dentistry's struggle for professional standing. It was contempt for manual training that led the American universities to refuse to establish dental departments in their schools till dentistry, with what now seems to have been almost superhuman faith in her destiny, established schools of her own in which she enlarged the domain of her art, as its different branches became rooted in their underlying sciences, while by patient training in manual dexterity she raised the art of dentistry, in its final expression of restoration, to the plane of the fine arts. Unaided and alone she proved her high calling, till today the new education finds in dental education the embodiment of its highest ideal—the training of the head, the heart, and the hand.

RÉSUMÉ.

In general education, character is the primary object; the profession or life-work is secondary. This order should obtain in the preliminary education of the dental student.

The new educational ideal comprehends the development of man's threefold nature—the head, the heart, and the hand. By new education is meant the present educational system as opposed to the oriental and classical systems that preceded it.

The United States has a national edu-

cational system which is expressed in the kindergarten, the elementary schools, the high school, and the university. Manual instruction is a part of the whole school course till the close of the high school. A boy usually finishes the high-school course at about eighteen years of age. According to this educational ideal, dental education *as such* has no place in a boy's training till he finishes the high-school course.

A comparison of this course of instruction, up to the close of the high school, with the "preliminary education necessary for the student of dentistry" as embodied in Dr. Maurice Roy's report to the International Dental Federation at Stockholm, shows a classical high-school education in the United States to more than meet the requirements. A

university education should be encouraged in preliminary dental education, as the university man will find in dentistry full scope for the exercise of his trained powers.

The refusal to recognize the trained hand in man's complete development caused dentistry's struggle for professional recognition. Contempt for manual training caused the American universities to refuse to establish dental departments in their schools till dentistry, with what now seems to have been almost superhuman faith in her destiny, founded schools of her own and proved her high calling, and now the new education finds in dental education the embodiment of its highest ideal—the training of the head, the heart, and the hand.

SELF-CULTURE ESSENTIAL TO THE UPLIFTING OF THE PROFESSION.

By JOHN A. CHAPPLE, D.D.S., Atlanta, Ga.

(Read before the Kentucky State Dental Association, at Louisville, Ky., May 18, 1904.)

IT is not our purpose to advocate the disenthronement of gold or the debasement of porcelain; to argue the etiology of pyorrhea, or the possible pathological effect of saliva. Nor shall we be drawn into the seductive vortex of dental education, with its four-year-course amendment. These are problems as yet in embryo, and we are quite content to leave them to that infallible prognostician, Time, for their ultimate solution. But rather we would draw away from those things which characterize us as mere artisans in the public eye, and endeavor to analyze the reasons for this attitude of the public toward us as a profession.

DIAGNOSIS OF THE SUBJECT.

To "know thyself" is as imperative today as when Plato first inscribed it over

his doorway. To know thyself, therefore, calls for the "taking of stock," to determine your debtor or creditor relationship to the commercial world; it demands that you shall take your latitude and longitude, the better to mark your true position on the broad expanse of old Ocean's bosom.

If in the taking of stock the debit column exceed the credit column, the wise man sets about at once to readjust himself; and if the mariner discover that he is out of his course, he loses no time in verifying his compass and turning his pilot's wheel accordingly.

Thus, if we would profit by the example of the business man and the sailor, we shall, in our effort to know ourselves, discover much to censure and regret; but if we are wise, we shall not be slow to throw off such impedimenta to our upward progress—in its highest and best

sense—and blaze out a new pathway, along which all true men must come who would wish to place their profession upon a basis coequal with all professions.

We have patted ourselves upon the back and fairly filled the air with eureka as a result of our achievements, until we are almost drunk with self-adulation. We have accomplished much, and have justly earned our right to a place in the healing art—which was courteously acknowledged recently at New Orleans; yet, have we wholly dissipated our traditional origin in the minds of the masses? We think not, and the reason is to be found in two or three propositions.

Hitherto, the literary qualification of those seeking entrance into dentistry was not emphasized as it is today, and hence the natural trend of the practitioner has been in the pursuit and development of the mechanical features of the art, minus the effort for self-culture in those intellectual graces which always compel recognition and which constitute the crowning glory of any pursuit. That we have been criminally derelict in this respect should occasion no surprise, since our own literature has failed to receive that moral and material support it so richly deserved. This lamentable lack of esthetic culture, even among those of recognized practical ability, is quite manifest to the least cultured of our own *clientèle*, who are unable to reconcile our claims for any extraordinary strides in professional development.

CONTRIBUTORY CAUSES TO ELEVATION OF THE PROFESSIONS.

The status of the legal profession is not due alone to the ability of its members to plead law successfully before courts and juries, but because of a liberal education and the broad culture of its advocates, who draw their inspiration from every avenue of learning. Not only in his own literature has the lawyer shown unusual gifts in authorship, but he has left his impress upon almost every intricate problem in science and art, and has literally reveled in fiction.

Will it be denied that the legal profes-

sion was elevated in public esteem when one of its devotees gave to the world that delightful romance, "When Knighthood Was In Flower"? Who now remembers Richard Henry Wilde as the brilliant congressman and attorney-general? This service to his country has long been forgotten, and in the popular mind is eclipsed by the chaste beauty and even artless simplicity of his lines,

My life is like the summer rose
That opens to the morning sky.

Nor can it be affirmed that the status of the medical profession has been attained through the medium of *matéria medica* and surgery alone. While the M.D. has ever been a conspicuous figure in politics, and has thereby brought to himself and his profession some little prestige, yet his most potent influence is seen and felt in the material upbuilding of the community in which he lives. He is keenly alive to his environment, and inspires counsel and mutual confidence. Loyalty to his citizenship is not his only virtue. He too, like the disciple of Blackstone, has delved into literature, and Conan Doyle and Weir Mitchell are the just pride of the profession today.

In the marts of commerce, the representatives of trade and finance are not wholly content with the expansion of their trade limits or the accumulation of accrued interest, nor are they willing to move in a circumscribed environment. The metropolitan merchant prince and the Wall-street manipulator of his own or other people's millions, in the midst of most laborious work find time to discuss through the medium of current literature great problems of public policy and economic questions. In the Church, in politics, in philanthropy, and in literature he has exercised an influence for good, and has thereby dignified himself and his calling. Who now associates the name of John Hancock with that of merchant and large shipping interests? To the casual reader of history he is better known as standing in the circle of colonists, protesting against the wrong of "taxation without representation," and as one whose autograph in the Declara-

tion of Independence, from the boldness of its lines, is a fitting index to his character. And yet, while engaged in this patriotic service his mercantile affairs were not despised or neglected.

While these examples could be multiplied, it is amply sufficient to know that the lawyer, the physician, and the merchant are broad enough to look above and beyond their own horizon, and to interest themselves with the affairs and the well-being of their fellow man.

A LARGER CONCEPTION OF LIFE NEEDED.

The logical deduction from our argument naturally points to a larger conception of life on the part of the dentist, whereby he may contribute his share to the impartation of a more elevated tone and vitalizing force to dentistry, and thereby shape its life and destiny so as to make them coequal with those of all the liberal professions.

To discuss in detail on every occasion with your chance acquaintance the day's work in your office neither interests nor instructs him, and you have but confirmed his hitherto vague suspicion regarding the status of every dentist as that of an artisan pure and simple.

To single out, here and there, isolated exceptions in our own profession does not refute the painful truth of this widespread suspicion. Nor can we hope to lessen its force in our day. But we appeal to those who are to follow in our wake, and charge them with the task of throwing off this yoke and of striving for higher ideals.

Perhaps it will be urged that a requisite of success, in these strenuous times, is concentration of thought and energy in one direction. We fully appreciate the force of the suggestion, but reply that the strong man may be graceful; the athlete in the Olympian games was the only fit model for the sculptor's chisel. The man of force and influence achieves distinction as much by his broader culture as by his skill in technology; why, then, think you that personality should be submerged in the toil and business of our vocation? At all times and every-

where, the graces, the courtesy, the culture—in short, that fine feeling that is so hard to define but so easy to discover—are all forces that distinguish the one in the multitude. In Elihu Burritt, did the people see the blacksmith or the self-cultured linguist, the master of a score of languages? The marvelous mental achievements of this man, attained under such adverse circumstances, challenged the admiration of the world, and Burritt at the forge was lost in the remarkable personality of Burritt the linguist.

But, you say, while this arraignment of the profession is justified by the facts, what have you to offer as a remedy?

In a word, Emulate the example of the lawyer, the physician, and the merchant. Come out of your hermitage; get away from the atmosphere of your office; forget how many crowns and bridges you have made or that are in prospect. Take an interest in your neighbor and your community's welfare. Have you a library in your town? If not, agitate the building of one; talk it on the streets and through the press. Get together, and in the organization, by reason of your initiative in the matter, you will naturally become a director of its affairs.

Is your present city government apathetic to general improvement, and does it offer no encouragement to those who would enlarge its sphere of commercial and educational usefulness? Throw yourself into the breach and arouse public sentiment on the question. Is there a church, college, school-house, orphanage, or hospital to be erected in your town? Beg the privilege of subscribing to the fund, irrespective of the organization under whose auspices they are built. Is there a bitter political warfare being waged between your fellow citizens, wherein no great moral question is involved? Keep out of it!

THE DENTIST'S RELATION TO DENTAL PERIODICAL LITERATURE.

What are you reading in the way of dental literature? Are you depending upon the *Monthly Jaw-Bone*, the *Golden Crown*, and "sample copies," or are you

getting your inspiration from recognized standards? You will never get the exact figures from the publishers, but enough is known to warrant the assertion that, compared with the literature of other closely allied professions, our best current literature is not sustained as it should be. But what about your miscellaneous reading? Ah, herein lies the dentist's most vulnerable point of attack! After he will have perused his weekly town paper, noting the births, deaths, marriages, and sheriff's sales, with an occasional glance at the *Congressional Record*, the gray matter becomes surfeited, the wheels refuse to run any further, and we have a typical case of innocuous desuetude—living and dying in ignorance of the fact that there is anything, even in classical literature, a knowledge of which would make him a better dentist.

The lawyer, the better to fortify himself in a suit for damages for physical injuries sustained by his client, must needs go and learn something of medical jurisprudence. So, too, it is the high privilege of the dentist, the ambitious dentist, who strives for lofty ideals, to go outside of his text-books and find a most helpful adjunct to his daily work by familiarizing himself with the rudimentary principles of art—that phase of art that we see illustrated upon the canvas, in sculpture, in ceramics, and in architecture.

Most assuredly a knowledge of the proper blending of colors would prove of

immense value to those who would excel in porcelain work and in certain features of dental prosthesis. As for architecture, many of its cardinal principles confront us almost daily; and while we may be conversant with their application and usage, we are comparatively ignorant of the true scientific basis upon which they are founded.

We have thus briefly indicated a course of procedure which, if pursued, will surely exonerate us from the charge of artisanship and place us in our just relation to society. And in our claim for self-culture as essential to the dignifying of the profession, we are abundantly sustained in the curricula of the technological schools of the country. From the making of an electrical or industrial engineer down to the making of a simple wood-carver or textile-weaver, a classical education goes hand in hand with a practical education and we have as a result an ideal product. Moreover, in the sanguinary business of educating men in the science of war—a science which teaches them how best to defend themselves and to destroy their enemy—a classical equipment is deemed necessary for such a career.

Finally, in this struggle for higher excellence, think not that this culture is genius, this adornment a gift, for—

The heights by great men reached and kept
Were not attained by sudden flight,
But they while their companions slept
Were toiling upward in the night.

THE X RAY.

By R. A. McDONNELL, M.D., New Haven, Conn.

(Read before the New Haven Dental Association, at its first annual convention, New Haven, Conn., March 15, 1904.)

IN the field of medicine everything which is mysterious appeals to the popular mind. The laity use common sense in almost every other direction than in the care of the health, but from time immemorial things which had no parallel in everyday life were eagerly credited as being feasible in the restoration of health.

It is curious to read the records of Pliny of the methods in use in his day for the cure of disease. Crushed frogs, horses' hoofs, the hair of black dogs, and many other things which were supposed to have some charm about them were commonly employed to combat the ailments of the people. Later, mesmerism became a cult, and many of the fads of the present day, like osteopathy and Christian science, bear witness to the eagerness with which human nature seizes upon the obscure and mysterious in its groping for health.

With just such a feeling, the announcement in 1895 of the discovery of a form of light which would penetrate tissues formerly considered opaque was eagerly received by the suffering public as a possible means of relieving them of all their ills. Fakirs, being plentiful in medicine, quickly took up this new discovery, and proceeded to claim for it properties which it did not possess. Right in our own city, I am told, there are physicians who, without asking a patient to describe his symptoms at all, will stand him up before the apparatus, and, looking through him with a fluoroscope, will announce just what ails him and will guarantee to cure him in so many visits. Such practices have thrown this valuable agent into some disrepute, but now, after the lapse of eight years,

the possibilities of the new discovery are becoming more defined, and we know, to a certain extent, what it will really do.

The nature of the rays is obscure. They are cathode rays, generated in a vacuum by a static electrical machine or a coil, and reflected by a platinum target upon the part to be observed or treated. Such rays have the property of passing through objects which are opaque to light, but they do not penetrate all substances equally well. It has been found that a certain proportion of the rays is absorbed in passing through any substance, and that the amount of absorption of the rays is directly dependent on its gravity or density. Therefore, if the atomic weight of the elements which make up a given body be known, it may be calculated, in a rough way, just how penetrable that body is to the X ray. For instance, water is the chief constituent of the skin and muscles. Water is made up of hydrogen and oxygen, comparatively light as regards atomic weight; therefore, skin and muscles absorb but little of the rays in their passage through these tissues and are almost perfectly transparent by means of these rays. Bone, on the other hand, contains considerable quantities of calcium, potassium, magnesium, and sodium, bodies of high atomic weight; therefore, a large proportion of the X rays is absorbed in their passage through these structures, and they are therefore less transparent by means of the rays. Metals are but slightly penetrable by the X ray because of their atomic weight. The abnormally present fluids of the body, such as effusions in pleurisy and peritonitis, differ but little in their penetrability from water, whereas blood, containing a con-

siderable proportion of iron, is much more opaque.

It will be at once seen, then, how valuable for purposes of diagnosis the X ray has proved to be. In a dark room with a good machine it is possible to see clearly all the bones of the limbs and trunk, and to make out, with considerable accuracy, the heart, liver, stomach, kidneys, and other organs. The examination of these parts by the fluoroscope is very interesting. By way of preparation for an examination of the stomach or intestines, the patient is fed a hearty meal of bread and milk well mixed with subnitrate of bismuth, which drug is quite opaque to the rays. The outlines, then, of the alimentary track can be quite well made out, foreign bodies of a metallic nature may be detected in this way, and new growths may sometimes be discovered from the change which results in the contour of the organs.

Considerable difficulty attends the satisfactory examination of the soft parts where such a distance has to be traversed by the rays as is the case in abdominal examinations. The technique is something as follows: The patient lies down upon a stretcher of canvas suspended between two poles, the vacuum tube from which the rays proceed is placed beneath him, and the observer with a fluoroscope stands above him. The diminution or increase in the amount of exudates, such as those found in pneumonia, pleurisy, and peritonitis, may be observed. The movements of the heart may be witnessed, changes in the density of the lungs, indicative of beginning tuberculosis, may often be made out, and other interesting and valuable data may be obtained.

The taking of pictures by means of this light differs considerably from the ordinary process of photography. Any sensitized plate may be used, but it must be well protected from the rays before it is desired to take the picture. These rays will penetrate walls and floors, so that sensitized plates are ordinarily kept inclosed in dark manila envelopes, in an iron box, in a cellar, until ready for use. Then, still inclosed in the dark envelope,

they are placed on the opposite side of the patient from that occupied by the vacuum tube, and held by a suitable clamp for varying periods—three to ten minutes being required, according to the style of machine used; then the plate is taken to a dark room and developed in the ordinary manner in vogue for developing photographs.

Such radiographs, however accurately made, fail to show all the details which can be seen by means of the fluoroscope. The fluoroscope itself is shaped like a large stereoscope and receives upon a screen a shadow of the object. The screen is simply a piece of cardboard coated with crystals of tungstate of calcium. With this instrument the observer can not only get an immediate idea of the conditions present, but also a more accurate idea than he can from the radiograph, because he can vary the direction of his observations and locate precisely the region of the difficulty.

When all is said, however, the diagnostic value of the X ray is much greater in surgery than in medicine. Fractures and dislocations, necrosis of bones, the presence of bullets, of pins and other foreign bodies, may easily be made out, without the necessity for removing bandages or wooden splints, so that the surgeon is prepared to proceed directly to the part which needs his attention, and to treat it with a degree of intelligence which would not be possible in the absence of the information gained by this means.

What the X ray will do in the way of treatment depends very largely upon the distance to be traversed by the rays. That they will profoundly modify new growths of various kinds is unquestioned, but the character of the modification varies decidedly with the depth of the growth. For instance, cancers of the skin, such as epithelioma and rodent ulcer, will simply shrink and dry up without any apparent inflammation under the use of this agent, while cancers seated a little below the surface seem to be softened and rather sharply walled off from the surrounding healthy tissues, disappearing finally, when they

are cured, by a process of suppuration. These, however, are much less likely to get well than cancers of the skin. Cancers in deep-seated parts, such as the liver or abdominal glands, seem simply to be retarded in their growth during treatment, and no positive curative effects can be expected.

Incidentally, during the treatment the pain caused by such malignant diseases is very decidedly controlled, even better than by morphin, and the general health of the patient seems to be improved.

Occasionally, bad accidents happen during the treatment, such as severe burns which are most difficult to heal. This winter I saw a burn of the abdomen in a woman who, about a year previously, had had a number of prolonged exposures to the X ray for the treatment of fibroids of the uterus. The resulting burn was about a foot square and extended through the skin and subcutaneous fat even down to the muscles. It caused sloughs and necrosis of tissues, and, although all the resources of surgery, such as skin-grafting and the like, were called into play to heal it, it was still an ugly sore a year after it began. The operator himself often suffers from burns of the hands acquired during his manipulations, and there is a physician in the Massachusetts General Hospital who has recently lost two fingers from this cause.

Another untoward result which may occur is a loss of hair over parts accidentally exposed. A good deal of the hair thus lost will return later, but the final result in such cases is a general thinning. Besides cancer, a good many chronic diseases of the skin can be cured by this agent. Chronic eczema, old patches of psoriasis, lupus, acne, old ulcers, and other diseases of a chronic type are all benefited in a way which, with our present knowledge, is mysterious and little short of marvelous.

Of particular interest to this body would be the use of the X ray in dental surgery. A special form of apparatus is necessary to get the best results, because the rays must be concentrated on a small area, and this area is particu-

larly likely to suffer from burns. To prevent the rays from falling upon parts which are not to be observed, a screen of metal is interposed between the vacuum tube and the patient, the screen having a window in it the size of the area under observation. The photographic films are inclosed in flat soft-rubber bags and placed inside the patient's mouth. The time of exposure necessary to obtain a good negative varies with the machine, from a few seconds to five or six minutes. Satisfactory photographs may be obtained which will show unerupted teeth, position of roots, alveolar abscess, absorption of roots, or fluid in the antrum. Dental instruments are not infrequently broken off in filling teeth and particles of metal left behind which may cause suppuration. Such foreign bodies have been a number of times discovered with the X ray. Fractures of the jaw from difficult extraction may be diagnosed and fragments of bone located.

Since the discovery of radium and its exploitation in the newspapers, patients are continually asking how it compares in efficacy with the X ray. Radium at present is in the purely experimental stage. Reports of wonderful cures with it have already been made, but, on the other hand, reports of failures in exactly similar cases are also forthcoming. That it is a powerful agent for either good or harm is certain. Only yesterday I was reading of a physician who, for experimental purposes, tied a little box containing a small amount of radium to his arm and left it on for two hours and a half; at the end of this time no effect was noticeable, but after the lapse of a week a necrotic area appeared extending considerably beyond the site of the application, and a short time later three other similar necrotic areas appeared on distant parts of the body. These were absolutely painless, but extended deeply into the tissues, and after a considerable lapse of time remained unhealed.

The great expense of radium is a decided hindrance, and, until the experience of many shall have marked out its

limits and its possibilities, I for one shall not use it upon my patients.

During the last few years many other forms of light have been tried in the treatment of disease. The violet rays of the spectrum are applicable to many diseases of the skin; the red rays have been used successfully in preventing the pitting in smallpox and such diseases. Ultra-violet rays are now being tested.

The Finsen light has been very successfully used in lupus, and in general we are awakening upon a new era of therapy—the photo-therapeutic age.

Further details about the use of the X ray would probably prove tedious to this body, so I will not inflict them upon you. I should be glad to welcome any of the gentlemen present who may care to see my apparatus at any time.

PROCEEDINGS OF SOCIETIES.

CONNECTICUT STATE DENTAL ASSOCIATION.

Fortieth Annual Session.

TUESDAY—*Morning Session.*

THE fortieth annual session of the Connecticut State Dental Association convened in Unity Hall, Hartford, Conn., April 19 and 20, 1904.

The first session was called to order on Tuesday, April 19, at 10 A.M. by the president, Dr. George O. McLean, of Hartford.

The regular custom of having an annual address from the president was substituted by the reading of an historical sketch of the society by Dr. JAMES MCMANUS, Hartford, as follows:

AN HISTORICAL SKETCH.

The historian can readily point to the names of men who practiced dentistry previous to 1800 who were medically educated and were skilful operators and artistic mechanics. Among the number were a few who for their day, and also judging by the standard of today, were men of rare scholarly attainments as writers and translators; and the work they did and the published records they have left to us place them as peers among professional men.

These early exceptions—men with liberal education and holding the medical degree—did not and could not gain for

dentistry in this country recognition other than as a trade, or to its workers a status above that of the mechanic. It was recognized early in 1800 by Dr. Horace H. Hayden, a native of Connecticut practicing at that time in Baltimore, Md., that dentists, if they wished to gain knowledge, experience, and increased skill, must band together in associated effort and strive to break down the barriers that surrounded the men and offices where selfish and secret methods prevailed; and after years of persistent work he was successful in calling together enough men to organize a dental society in New York city, August 18, 1840.

The same Dr. Hayden and the men associated with him in that society had long before tried to interest and influence medical men to add a dental department in the medical schools; but their request was denied, and as a result the Baltimore Dental College was organized, and held its first session in 1840. The organization of the American Society of Dental Surgeons, with Dr. Horace H. Hayden as president, and another Connecticut man, Dr. Solyman Brown, as recording secretary, and the establishment of the Baltimore Dental

College with Dr. Hayden as president and professor of the principles of dental science—both events occurring in the year 1840—mark the birth of dentistry as a profession in this country. The experience of the American Society of Dental Surgeons was a stormy one for a few years, and it was then dissolved. The success of the Baltimore Dental College was followed by the incorporation in Cincinnati of the Ohio Dental College in 1845, and of the Pennsylvania Dental College in 1856. The American Dental Convention was called in 1855, and the American Dental Association was organized in 1859. This association started out with twenty-five members, sent as delegates from eight societies and two dental colleges. The principal official act of this association was the promulgation of a code of dental ethics in Boston in 1866.

Thus far, in brief, is a partial record of the dental profession up to 1860. There were a few men holding the medical degree in New England who had taken up dentistry, and there were also a few possessing an education higher than that given in the public schools, who had spent from a few weeks to a few months in the office of practicing dentists who had gained their own knowledge from a no higher source. The larger number were men of limited education, whose sole claim as dentists was their mechanical ability—and pretensions. Connecticut no doubt had her proportion of good dentists, for we find that as early as 1838 Horace Wells, surgeon-dentist, Hartford, published a little book of seventy pages entitled "Essay on Teeth," and later, December 11, 1844, he voluntarily inhaled nitrous oxid and submitted under its influence to a surgical operation; thus he discovered, demonstrated, and proclaimed the blessings of anesthesia. Hiram Preston, surgical and mechanical dentist, Hartford, Conn., in 1848 published a book of 104 pages entitled "Hints for the Multitude Relative to the Teeth." As far as I can learn, these two were the only dentists practicing for years in this state who had given out to the public in book form

any information or instruction regarding the care of the teeth.

We find also that the Baltimore Dental College conferred the honorary degree on four dentists credited to Connecticut. Only two of the number had lived and practiced for many years, until their death, in this state—Asa Hill, D.D.S., Norwalk, 1847, and E. E. Crofoot, D.D.S., Hartford, 1853—and there were regularly graduated from that college Henry J. Stevens, D.D.S., 1852, and Charles O. Hall, D.D.S., East Hartford, 1860. There had been a few men with a medical degree who had spent a little while practicing dentistry in different parts of the state, but the names I have given you were the only Connecticut men holding a dental degree up to 1861.

The first gathering of dentists that I attended was the annual meeting of the American Dental Convention held in Music Hall, New Haven, August 6, 1861. This was a popular convention admitting to membership anyone claiming to be a dentist on payment of the annual fee. The sessions were very interesting, especially the discussions on "Etiquette" and "The Fraternal Relations and Courtesies Among Dentists and Physicians." Professor Hooker invited the members to visit the Yale Medical School, and also addressed the convention and took part in the discussions. The faculty of Yale appeared to be more interested in dental affairs then than at any time since. I met there and listened to a number of the prominent dentists of the country, but was very much disappointed in not seeing more of the Connecticut dentists, as only nineteen were present.

The Connecticut Valley Dental Society was organized in Springfield, November 10, 1863, and there was only one Connecticut man at that meeting, Dr. Chester Johnson of Enfield. The third meeting of the Connecticut Valley Dental Society was in Hartford, May 6, 1864. It was called there to meet Dr. Jonathan Taft of Cincinnati, Ohio, who was making a tour of the Eastern cities as the representative of the American Dental Association to arouse an interest

in the formation of local dental societies. He was accompanied by Dr. Wm. H. Atkinson, then of New York city. The meeting was a very interesting one, but only five Hartford dentists took interest enough in its success to become members. At this meeting I was appointed a delegate to the meeting of the American Dental Association, which was to be held at Niagara Falls in July.

The meeting of the American Dental Convention at New Haven in 1861, and of the Connecticut Valley Dental Society at Hartford early in 1864, failed to awaken any interest as to the need of a dental society in Connecticut. The long-time habit of secrecy and exclusiveness maintained by many of the older dentists rendered them apparently unable to see or to appreciate the magnitude of what was being done for dentistry in the middle, western, and southern states.

The Niagara Falls gathering was a revelation. The character and well-known ability of the members, the kindly, helpful spirit manifested at the meetings, and the cordial good-comradeship shown at all times, filled me with a desire to obtain for Connecticut a right to send delegates to that association. Soon after my return from that meeting I consulted with a young dentist, Dr. Leroy D. Peltom, and we appointed ourselves a committee and sent out a circular invitation to the dentists of the state to meet in Hartford, October 20, 1864, to assist in organizing a state association.

A part of the circular read thus: "You understand the objects sought by an organization of this kind: the advancement of its members in professional knowledge, and the better establishment of fraternal love and good-fellowship. That there are individual and public benefits to be derived from a free interchange of professional opinions and experiences must be obvious to every thinking man, and presuming that you are a thinking man we call your attention to the subject and ask your hearty co-operation."

We were more than pleased with the response to our circular. As thirty-nine

dentists responded, a temporary organization was effected by the election of Dr. E. E. Crofoot as president, and Dr. J. McManus as secretary. A committee was appointed to draft the constitution and by-laws, which were adopted at the afternoon session, and the following named gentlemen were elected: Dr. Asa Hill, Norwalk, president; Dr. W. W. Sheffield, New London, vice-president; Dr. James McManus, Hartford, recording secretary; Dr. Leroy D. Peltom, Hartford, corresponding secretary; Dr. E. E. Crofoot, Hartford, treasurer; Dr. Charles P. Graham, Middletown, librarian. Executive Committee—Drs. Samuel Mallett, John T. Metcalf, and H. J. Stevens, all of New Haven.

At the meeting for organization the subject of the Boston Hard Rubber Company claim for tribute was discussed, and the following resolution was adopted: "*Resolved*, That the members of this association hold themselves in readiness to contribute the sum of ten dollars each to the Boston Protective Union for the purpose of defense against prosecution for using hard-rubber base whenever in the judgment of the executive committee it shall be deemed expedient." In the evening a reception was given to the members by Mr. James H. Ashmead, of the firm of Ashmead & Hurlburt, gold foil manufacturers, at his residence on Wethersfield avenue.

At the May meeting in 1865, in his address, the first presiding officer presented some practical suggestions, a few quotations from which may interest you all, and also recall to the few older members the genial presence of that eminently good man and dentist, Dr. Asa Hill of Norwalk: "As individual members of an honorable profession, it is fair to presume that we have accorded to us by the community in which we live our appropriate status, and that we each of us wield the influence to which we are justly entitled. . . . But what shall be the character of our association, and what can we do for each other and the public around us? . . . I trust that a mere ephemeral existence will not satisfy the purpose and designs of those

who are present today. . . . To save us from disintegration and dissolution there must be a common interest, and that interest must be perpetual. We shall find that interest in our mutual improvement if we do not withhold our individual contributions to the common stock. Now, there may be individuals who could get along very well without the aid of such associations, but I shall do no injustice to such if I should say that no one man knows everything, and he must be a very dull scholar who cannot learn some valuable lesson from an inferior mind. . . . 'Another great object we should ever have in view at our meetings should be the public good; we best serve ourselves when we are serving others well. . . . This thought should ever save us from mean and petty jealousies. . . . Scientific pursuits are always ennobling, and dental science is kindred to medical science, and medical science intermeddles with all knowledge.'

Dr. Hill also spoke of the advisability of the Yale Medical School adding a dental department, and later, in May 1866, he sent a communication to the president and faculty asking for its establishment. The State Association at the annual meeting appointed a committee to visit the Connecticut Medical Society and present the matter to them. The members listened with surprised interest, and the subject was dropped. The Yale managers then lost their opportunity, for Harvard College the next year established a dental department.

At this meeting a paper was read by Dr. Isaac Woolworth of New Haven on the "Past, Present, and Future of Dentistry," one by Dr. Samuel Mallett of New Haven on "Patience in Dentistry," one on "Means of Controlling the Flow of Saliva," by Dr. W. W. Sheffield of New London; and one by Dr. John T. Metcalf of New Haven on "Filling Approximal Cavities." Dr. Wm. H. Atkinson of New York by request gave his views on the use of the mallet and wedge in filling approximal cavities, and on the treatment of teeth with an open abscess. President Hill gave the proper method

of using the preparation known as "Hill's stopping."

The semi-annual meeting was held in New London, October 3, 1865, and the following visiting dentists were elected as honorary members: J. H. McQuillen, M.D., D.D.S., Philadelphia Dental College; Dr. I. J. Wetherbee, Boston, Mass.; L. D. Shepard, Salem, Mass.; F. Searle, Springfield, Mass.; Wm. B. Hurd, Williamsburg, N. Y.; and J. Chesebrough, Toledo, Ohio. Papers were read as follows: By Dr. Isaac Woolworth, on "What Causes Teeth to Decay"; by James McManus, on "Filling Approximal Cavities"; by L. D. Shepard, on "Professional Education."

The subject of irregularities and the study of models presented by Drs. Crofoot and Sage was taken up, and detailed methods of procedure were given by Drs. Shepard, Wetherbee, Crofoot, Woolworth, Sheffield, Sage, Atkinson, and McQuillen. At the evening session an opportunity was given the members to examine specimens of bone and teeth under the microscopes brought by Professor McQuillen and Dr. Atkinson, and all had a good chance to study the specimens and get clear and correct ideas of the structure of the teeth. To the majority this was a novel and interesting meeting. Professor McQuillen gave a lecture on the "Microscopy of the Dental Tissues," illustrating with large drawings, and the subject was discussed by Dr. Atkinson. A paper was read by Dr. Shepard, "Are You a Reading Man?" It was a strong plea for the support of dental journals. He made one statement that was a surprise to many. He said that "Only one dentist in five in our boasted New England was a subscriber to a professional magazine." You may judge from that statement of the professional, literary, and studious habits of the majority of the dentists previous to 1864.

The Transactions for 1864 and 1865, which were published in book form, contained the address of the president, Dr. Asa Hill, and the papers by Dr. Isaac Woolworth, Samuel Mallett, John T. Metcalf of New Haven, W. W. Sheffield

of New London, L. D. Shepard of Salem, Mass., James McManus of Hartford, Wm. H. Atkinson of New York city, and Prof. J. H. McQuillen of the Philadelphia Dental College; with the discussions, records, and names of the officers and members.

The Hartford Society of Dentists was organized in 1865, and in 1870, with the co-operation of the State Association and the Connecticut Medical Society, a movement was made that resulted in placing a statue of Dr. Horace Wells, the discoverer of anesthesia, in Bushnell Park, July 22, 1874. An unfortunate change, increasing the initiation and membership fees, caused a falling away in the membership of the society and a lack of interest in the meetings for a few years. Another interesting event was the celebration of the fiftieth anniversary, and the unveiling of a tablet on the building on Main street which marks the spot where Dr. Wells made his discovery. It was a notable historical event. Among the guests at the banquet was Dr. Colton of New York, who was one of the famous trio and the one who furnished the nitrous oxid, also Drs. Gurdon W. Russell and P. W. Ellsworth, the Hon. Henry Barnard, and by letter the Hon. Alfred E. Burr, all over eighty years old and all personally acquainted with Dr. Wells when he made his discovery. The tablet was a memorial gift to the city from over 270 dentists, nearly two-thirds of the contributions coming from outside of Connecticut, and representing twenty-nine states of the Union. Mayor Brainard, in his response in accepting the tablet, assured the members of the State Association of the approval of his action by the city council and the citizens of Hartford.

I have given you detailed accounts of these early meetings and events so that the younger members might have an idea of the character and influence of the association in its earlier years, for it is hardly possible for them to realize the difficulties that had to be surmounted by all who desired to become dentists previous to the organization of this and

kindred associations. Frequently pictures of interesting scenery are shown with the remark that they do not give a good idea of the beauty; that the place should be seen. So with all statements descriptive of the methods and manner of dentists toward each other forty years ago; those only know who were in practice then, and they only can appreciate the great change brought about through the work and influence of associations.

In 1864 there were four dental colleges; now there are fifty-two, with dental societies in every state and many of the cities. There were only two dental journals then; now there are about twenty. The text-books then were few, now they are many, and the literature of the profession as a specialty is equal, if not superior, to any of the departments of science and medicine.

The population of Hartford in 1864 was 32,000, and the number of dentists was fourteen. The population today is 87,836, and the number of dentists is seventy-five.

The population of the state in 1864 was 491,000, with 135 dentists; the population today is 973,000, and the number of dentists registered and licensed is 500.

Of the thirty-eight dentists present at the organization of this association forty years ago, there are living today only eight; two of these withdrew from membership many years ago, three have lived out of the state for many years; only three members are left to recall the first meeting and the earnest men that responded to the call of the promoters, whose sole aim then was to band dentists together for the advancement of professional knowledge, manipulative skill, and the cultivation of good-fellowship. They know, and all that have since held membership know, that the association has always advocated and striven for a high standard of educational, professional, and ethical methods.

Over fifty years ago it was said by Dr. Horace H. Hayden that "We assume the title and claim the rights and privileges of being the studious, diligent, and successful cultivators of at least a branch

of that important, noble, and only divinely sanctioned science that was ever cultivated by man—the science of medicine.” Surely today the members of this association can indorse the sentiments expressed by the father of American dentistry. It has for forty years done earnest work along the line indicated, and up to the standard set by him, and we can justly feel proud of the success and professional record of our State Association.

Dr. E. W. PRATT moved that the his-

torical sketch as presented by Dr. McManus be received as read by him and placed on the records of the Connecticut State Dental Association, and that the thanks of the society be expressed to Dr. McManus for preparing and delivering the same.

The motion was carried unanimously.

There being no other business on hand, the motion was made and carried that the meeting adjourn until 2 o'clock P.M.

(To be continued.)

NEW HAVEN DENTAL ASSOCIATION.

First Annual Convention.

(Continued from page 465.)

ON motion the subject was passed, and the Association listened to a paper by R. A. McDONNELL, M.D., New Haven, on “The X Ray.” (Printed in full at page 558 of the present issue of the COSMOS.)

Discussion.

Dr. H. E. HOSLEY, Springfield, Mass. I would like to make a statement of an interesting case that called into play the X ray. About six weeks ago a young lady of twenty-five presented herself with a temporary lateral in a very loose condition. There was no sign of the permanent tooth coming into place. I made use of the X ray, and we were able to locate the lateral, so wedged in by the canine that it could not come into place. The case was operated upon, and now the lateral is being coaxed into position.

Dr. G. LENOX CURTIS, New York. I think that the only safe use to which the X ray can be put in our work is for examinations. I have looked over the ground from the beginning, and it is my experience that there is more harm than good resulting from treatment with the X ray. It is, however, particularly valuable in the examination of the jaws,

especially in cases like that mentioned by Dr. Hosley.

I will state one case in which the X ray was misleading. A patient came to me for the treatment of a disorder in the floor of the mouth. There was a discharge from the neck that seemed to come from the lower jaw, on the right side. On this side of the jaw all the teeth from the first bicuspid back to the third molar were gone. The question was raised as to the desirability of a radiograph being taken before an operation. I warned the patient of the danger of the disease, and advised her to select an operator who had had good success with this work. When the negative was brought to me I distinctly saw what appeared to be an encysted molar on the right side. I sent for the operator, and he said he was certain that it was a molar on the right side of the jaw, where all the teeth had apparently been removed. I asked him about the position in which he placed the head during the examination, and found that he had turned the right side of the face up, so that the right side was higher than the left. I then took exception to its being an impacted tooth, and told him that I

believed it to be the impression of a molar on the opposite side of the mouth. He did not think so, but an exploratory examination confirmed my opinion.

H. C. BOENNING, M.D., Philadelphia. I do not agree with the essayist in all that he has said. Concerning the use of the X ray for the purpose of diagnosis, the gentleman's remarks, I think, cover the field. I think that as time goes on the field of usefulness of this apparatus will be extended. I have lost all confidence in the X ray as a curative agent in the treatment of deep-seated growths. A notable sequela of the X ray is the development of the "X-ray burn." The rays cause cellular atrophy—a sort of cellular marasmus. The effect of the X ray on the skin is similar to the effect of the solar ray. We get into the sunshine and our face is burned, and there follows inflammation. If we exclude the heat ray, the sun will produce conditions similar to the X ray. This action is followed by atrophy. In the treatment of superficial growths there is a pronounced atrophic condition developed which has a retarding effect upon the growth. I do not, however, remember a single case where deep-seated tumor was benefited by the application of the X ray.

With reference to the radiograph, in our experience, there is nothing more difficult to get than a good radiograph of the lower jaw. When taken from the side you have the contour of the two blended. You must take separate radiographs of the two sides and of the front to get a good radiograph.

The development of light-therapy is a matter of the greatest interest. The effect of the ray on the outer tissues is pronounced, but when it comes to the therapeutic effect of the X ray on deep-seated growths we have yet to see it demonstrated that the treatment will bring permanent results. As to its effect in relieving pain, there is no question that there is considerable modification of the pain in malignant growths.

C. E. SKINNER, M.D., New Haven. It has been stated here this afternoon that all confidence in the X ray as a curative agent for deeply located malig-

nant growths is being lost. While this is true as far as the majority of cases is concerned when the X ray is relied upon alone, yet it is not true as a bald statement. Many cases of cancer of the breast have been cured by the X ray alone; several abdominal cases, presumably malignant, have been cured by the X ray. Permit me to say that when I say "cured," I mean that the growth has disappeared, and the patient remains apparently well to date. None of these cases have been under observation more than three years as yet, and whether the disease will ultimately return or not, only time can decide.

To show you to what an astonishing extent the X ray will sometimes exercise curative power in deeply seated malignant disease, I will cite briefly a case which occurred in my own personal experience. Six years ago a young Massachusetts woman had the uterus and ovaries removed for what was supposed to be a fibroid tumor. Nearly three years later she noticed a hard lump in the lower right side of the abdomen, and consulted Dr. Maurice Richardson of Boston, who pronounced it malignant and inoperable, and sent her to Dr. W. B. Coley of New York for treatment with erysipelas toxins. The tumor was then the size of a cocoanut. For the first two months it decreased in size under the toxins; then it remained stationary for several months, and finally commenced to grow steadily again. She came under my care in January 1902; the tumor then exhibited a diameter from side to side of ten inches, from above downward of about seven inches, and antero-posteriorly of about six inches. It was firmly fixed to the pelvis and was of a stony hardness throughout. To make a long story short, about the only changes produced by the rays during the first six months were a marked and immediate improvement in the general condition, a softening of the mass in spots, and a slight shrinking in the upper left area; it had seemed to increase slightly in the upper right region. It then began rapidly to shrink away, and at the present time there is left only a very slight

evidence of induration upon deep palpation in the lower right region of the pelvis. She resumed her duties as a school-teacher a year ago last September, and has since been as well and strong as she ever was. This is, of course, an extreme case, but it demonstrates that the X ray is sometimes capable of exercising a magical influence upon deeply located malignant growths. Here was a young woman hopelessly doomed to early death under any other line of treatment, who has been restored to usefulness and comfort. The X ray would be entitled to profound respect even if it had never benefited any other case than this. I will state here that the diagnosis of fibrosarcoma was microscopically confirmed by Dr. Coley in this case, which I shall report in detail later.

We do not depend, however, entirely upon the X ray in the treatment of deeply seated growths. We recommend extirpation first, when possible, and the X ray afterward. We feel pretty sure, when we extirpate first and treat with the X ray afterward, that we can reduce the number of recurrences very materially.

Dr. McDonnell says that the lesions under the skin, under this treatment, finally disappear through the process of suppuration. From my own experience, and that of others with whom I have discussed this subject, I do not think that this is so. The vast majority of the cases seem simply to fade away, probably through a process of atrophy and absorption. Certainly less than twenty-five per cent. of my own cases have shown any suppurative tendency, unless this process had been established before the treatment was commenced.

My experience with the X ray in dentistry has been confined to the treatment of a few cases of osteosarcoma of the maxilla, and I have never seen any curative results follow the X-ray treatment of a malignant process involving osseous tissue, whether it was the jaw-bone or any other bone. I know but one man who claims to have cured such a case, and he claims only one case. Dr. W. A. Price of Cleveland, however, has done a

great deal of work with the X ray in the dental line. He wrote me a few days ago of two cases which he reported before the Cleveland Dental Society, which may be of interest in this connection. They were cases of pyorrhea alveolaris, in which the disease was present in several of the teeth, and in the treatment of which he had used the X ray. To ascertain the effect of the treatment a certain number of the teeth were exposed to the action of the X ray, while the rest of the teeth were protected so that no rays could reach them. These cases had been under treatment for six and nine months. Upon those teeth that were exposed to the X ray the beneficial influence was very marked. In one the tooth had been loose, with pus discharging all the time; after six months' treatment there was no pus discharging, and the tooth exposed seemed healed. In the other case the beneficial results were just about as remarkable. There are very few men who have observed such cases, and we do not know the effect of the X ray on them. It is probable that it does not destroy the pyogenic micro-organisms directly, but simply makes the conditions unfavorable for their development.

In the treatment of X-ray burns we have a broad field for investigation. No two cases can be treated alike, as what benefits one will frequently aggravate another, and this is especially true as regards the pain which is nearly always present. The galvanic electric current, negative polarity, applied directly to the ulcerating surface through a bare metal electrode, or the high-frequency current, will do more to hasten repair in these sores than anything else, after the necrotic tissue has separated, and the high-frequency current even seems to hasten the separation of the slough in some cases. For the pain, the application of anodyne dusting powders or ointments, or an ice-bag laid over the ulcer, have given me better results than anything else. Each case is a law unto itself and must be treated according to the nature of the pathological process.

Dr. H. L. WHEELER, New York. In line with the remarks of the last speaker

regarding pyorrhea alveolaris, I would like to say that I am connected with the St. Bartholomew clinic, and Dr. Sinclair Tousey, of the surgical staff, has been experimenting along that line. One of the most distinct cases of pyorrhea I have ever seen came to the hospital some time ago, and by ordinary treatment we were unable to do anything for the patient; from week to week a very thick calcic deposit would be formed. She was subjected to the X ray following removal of the deposit, and after a few treatments the calcic deposits did not return, the gums began to assume a clearer and less inflamed appearance, and finally the condition of pyorrhea had entirely disappeared. I do not consider the case cured, but the results of the treatment were very beneficial.

Regarding radiographs, they have been able to get good radiographs from both the exterior and interior positions, by putting the plate in a rubber envelope and putting this in the mouth, getting an impression of half of the bone in that way.

Dr. McDONNELL did not desire to add anything to the discussion, and the subject was passed.

Motion to adjourn until Wednesday morning was made and carried.

SECOND DAY—*Morning Session.*

The Wednesday morning session was called to order at 10 A.M. by Dr. Brown, the president.

The first paper on the program was by Dr. H. L. WHEELER, New York, on "Porcelain Art in Dentistry." (Printed in full at page 547 of the present issue of the Cosmos.)

Discussion.

Dr. E. A. BOGUE, New York. The idea of using molded porcelain for fillings in teeth really originated with Dr. Wm. Rollins of Boston, and I am glad to see his splendid invention duly recognized by Dr. Wheeler.

Dr. Wheeler says that, chemically speaking, high and low-fusing porcelains

are composed of essentially the same materials, the difference being the proportions of these ingredients, and that the Jenkins low-fusing body has been often changed. Now, it is well known to those of us acquainted with the earlier experiments of Dr. Jenkins that nearly all his first productions were found to be unreliable in the matter of color, especially in the hands of the beginner in porcelain work, and although the material has been often changed in the various experiments that have been made in perfecting it, it has lately reached a degree of accuracy that can be relied upon. Although it may be a glass according to Dr. Wheeler's definition, viz, a substance all of whose constituents are susceptible of being fused together—which is the best definition for our present purpose that I have heard—it still is a substance that the average dentist can use successfully. Now, if its weakest point consists in the possibility of its being eventually affected by the fluids of the mouth, it must be tried for some length of time before we can know whether we may rely upon it or not. Some dentists grind their inlays after setting them. Is Dr. Wheeler sure that the inlays that he has seen, which seem to show the solvent action of the fluids of the mouth, have not been ground on their surfaces?

It is true that the high-fusing porcelains have hitherto shown a more natural-looking body for the teeth, and that the colors have been more stable, but it is exactly along these lines that Dr. Jenkins' experiments have gone, and he has produced an enamel that can give us the colors we want every time we use the proper shade. For purposes of inlay fillings, therefore, I regard Dr. Jenkins' new enamel as exceedingly well adapted to our purposes. It does not require so high a temperature as to cause bubbling, which several of the high-fusing materials often produce, and the colors do not burn out or become lighter when they are treated with reasonable care.

As to edge strength of either high or low-fusing porcelains, I do not consider that point any more essential than the edge strength in amalgam. If the edge

of the filling fit the cavity, there is no need for greater strength than any filling material we use naturally possesses. In the matter of shrinkage, as well as strength, Dr. Wheeler has given us a most valuable suggestion in advocating the jarring of the porcelain mixture until its particles are in close contact, and in absorbing all the water we can from its surface. This being done, and the sides and margins of our matrices being fused first, using only a small amount of material for the first baking, the center of the filling can be made afterward with the certainty of having an accurate fit or contour. If it become a question of continuous-gum work, where we are obliged to employ a body first and an enamel afterward, then no doubt the Parker body, which Dr. Wheeler finds to shrink the least, is the proper one to use; but that requires enameling.

If we are to become disciples of Dr. Moffatt, and are to learn carving and block work, we shall have to be guided by his splendid paper in the January 1904 number of the *International Dental Journal*. I have several of the high-fusing enamels, but when we want quick work we use Jenkins enamel in my laboratory.

Dr. Wheeler sees no reason why the inlay material furnished by the tooth-manufacturers should not be as good as their teeth and keep its color as well. The doctor must remember that teeth have a body and an enamel, and these two substances differ in behavior when exposed to heat. I do not see how we can be sure, if artificial teeth are pulverized, that we can get the same color when they are fused again, as only the English teeth are homogeneous, and they are notoriously prone to bleach out and become lighter under even a moderate degree of heat. As Dr. Wheeler has only desired to call your attention to the scientific side of porcelain art, I have taken the liberty of turning to the practical side, but I thankfully acknowledge the value of Dr. Wheeler's researches, which will be of benefit to each one of us who looks into them.

Dr. W. A. CAPON, Philadelphia. This

is an historical and scientific paper. I want to call attention to the importance of porcelain at the present time, when the controversy seems to be as to who originated it, and how long ago. It was so long ago that nobody at present cares who invented it; almost everybody has forgotten who did invent it, and I guess the man himself has almost forgotten it! It does not matter much to us how long ago this work was done and how it was carried out, but there are men who deserve credit for taking up the work that others left off doing, and carrying it to a successful issue. I do not wish to mention any names, nor do I wish to open a controversy which seems to be vital at present, but the fact of the possession of this knowledge is especially interesting to me and to many who have had sufficient practice and have been doing this work long enough to understand it. But the vast majority of the profession do not care very much about even that; they simply want to know something about how to do it.

Tensile strength I will touch on for the simple reason that the greatest test of any porcelain is in actual use in the mouth. These tests made out of the mouth, pulling the pins out of teeth, etc., do not amount to much, as it is applying the force in a manner that is never experienced in the mouth. It is a pulling force, while in the mouth the strain is in a pushing, grinding direction. If someone would invent a device by which the force could be applied as in the mouth, these tests might amount to something. I care not whether the tensile strength of porcelain be twenty-five, thirty, or thirty-eight pounds, if the lowest will stand the strain in the mouth.

With regard to the fusing-point of porcelain, it is not the fact of its fusing at so very high or low a temperature that gives it the necessary strength. Touching that point, I think this was ascertained by Mr. Hammond and myself in my own laboratory, and the results are not astray to any great extent—they may be two or three degrees off, but the man has to be a very accurate workman that will take a material with a fusing-point

of 2400° and get exactly the same result as somebody else. For instance, I make the fusing-point 2400° in my furnace, and he makes it 2380° in his; that practically makes no difference in the temperature. When you get nearer the fusing-point of gold it does make a difference, however, as that difference in the fusing-point would destroy your matrix. In the low-fusing bodies, if you allow the heat to go twenty points beyond the fusing-point, you are likely to affect the coloring matter, and that is the latitude of the low-fusing bodies. In the high-fusing it would take from forty to fifty degrees greater heat before affecting the coloring matter, therefore you have a greater latitude of variance in the high than in the low-fusing bodies. If you are using the low-fusing bodies, the heat has to be trained just exactly right, or you will get a change in the color. But the loss of shade is very easily overcome by experience.

I take exception to the essayist saying that the texture of porcelain is of equal degree of density when tapped as when subjected to pressure, and for proof of that you can take any material you may wish to, and do as he says, and take the same material and subject it to pressure; then break the two materials, and you will find that the texture of these materials is different, and that it cannot be possible for the particles to lie as closely together as when forced together by pressure. Another proof is to take an ordinary pressed tooth and grind the surface and it will show a very close texture, practically smooth. With four-fifths of the porcelain bodies, after baking and grinding in this way, you do not have an even surface. This is a point that is practical, and one reason that I speak of it is because that in grinding the porcelain after it is in the mouth you have not the same opportunity of getting a smooth surface as in the pressed tooth.

With regard to the extremely high fusing-points I do not think there is any necessity of going to extreme temperatures to get the stronger material, and I think anywhere in the neighborhood of 2200° or 2300° is sufficient for our use.

For an illustration of that, several years ago we had nothing but the Close's body to deal with. A few weeks ago I had occasion to renew a piece of bridge work made by myself a number of years ago. It was a jacket crown for one abutment and a porcelain-covered platinum crown for the other. I made the extension by running platinum wires from the jacket crown to the other abutment, building porcelain on this, and finally the whole mass was fused together. After years of constant use it had dipped a little between the abutments. I looked up my books, and found that this piece of work had been in for eleven years. I worked for fifteen minutes to get that jacket crown off, and the porcelain came off piecemeal; the last thing to come off was the veneer, but the porcelain in that was just as strong as it could be. That was Close's continuous-gum body, and was fused at 2300°. I do not want anything higher than that; it is not required.

With regard to the question of shadows, I think the result in that line is according to skill. I care not whether it is an old practitioner or a young man just entering the work, do not expect you are going to get the best results at once. If you are skilful, and have a tendency toward the artistic, porcelain work will come easy to you. There are plenty of dentists who can never become porcelain workers, simply because they are not adapted to the work. It is just the same with this work as it would be if we all were to try to reproduce a sketch now. There would be a few who could probably do it readily, but the great majority could not do it, yet most could acquire the skill. Just the same with this work; some can acquire the skill, and some cannot. As a proof of how difficult it is for some men to match colors, you see men go into a dental depot and when a tray of teeth is set before them they are thoroughly confused, and have to ask the clerk to select the proper shades for them. Ladies would be good porcelain workers, because they are trained in matching shades from early life, but it is different with men. With regard to opacity, that is a bugbear to a great ex-

tent, because opacity is not in reality what we are after.

Dr. Bogue holds my friend Dr. Wheeler as a man of authority on this work, and so do I to a certain extent, but I take exception to the statement that tapping the material to make a moist, glossy surface is something new. I agree with him when he says that porcelain has never been of as much benefit to the profession as at the present time.

Dr. C. F. ASH, Brooklyn. There are one or two points about which I would like to speak. One of these points is on the question of the dissolution in the mouth of the salts in the low-fusing bodies, and the other is the instability of color due to this washing out. I doubt very much whether Dr. Wheeler has had opportunity to observe many of the low-fusing materials for a long enough time to be able to determine exactly the washing out of the salts. I think possibly Dr. Bogue misquoted Dr. Wheeler in this respect when he said the doctor had observed this. Am I right?

Dr. WHEELER. I have observed in several of the low-fusing materials, Jenkins' among the number, that there has been, after a length of time in the mouth, a roughening of the surfaces and a loss of color.

Dr. ASH. How old were the fillings?

Dr. WHEELER. Three or four years.

Dr. ASH. My experience differs from that of Dr. Wheeler in this respect. I have seen some fillings made obviously not of the recent, but of the earlier product of Dr. Jenkins, that had been in the mouth for eight years, and up to the time that I saw them no roughening of the surfaces and no change of the color had occurred. I have no interest in speaking of this special body, but I simply wish to give credit where credit is due. I do not think that anyone who will use Jenkins' low-fusing porcelain properly will have any trouble whatever. And I venture to say that I can take any one of the bottles of low-fusing Jenkins enamel and make a dozen bakes, varying in size from the smallest porcelain inlay made up to the largest, and I think it

is safe to say that there will be absolutely no variation in the color. I would undertake, moreover, to make a number of inlays out of this material as against a similar number made by Dr. Wheeler from any high-fusing body on the market, and compare results.

I think the secret in getting the right shade, or rather the failure to get the right shade, is due to the fact that most men in the beginning of their work are in too much of a hurry to get the inlay made and inserted in the mouth. You cannot do quick work with porcelain and do it right. You may do it sometimes, but not always. The burning out is due to too much heat. When you fuse the Jenkins body by the accumulation of heat—that is, at the lowest possible temperature that it can be fused at—you will never burn out the color. Am I right?

Dr. WHEELER. Yes.

Dr. ASH. I have yet to see a case with the color burned out when the fusing was properly carried out.

I think with Dr. Capon in regard to the tensile strength of the various bodies, that most of those on the market will stand the strain in the mouth. I have learned, however, from my observation of porcelain fillings in the mouth that it occasionally occurs that a portion of the enamel inlay will break. This is due more to the improper shaping of the cavity than to the porcelain. I am very much interested in the tests for the strength of the different bodies, and I want to ask Dr. Wheeler how closely his figures on tensile strength compare with the tests made for Dr. LeCron by the United States Laboratory in Washington, and published in the *Dental Summary* for November 1903.

Dr. WHEELER. I have not been able to get them.

Dr. ASH. I think that the Jenkins body will show better in that report than in this.

Dr. WHEELER. I do not claim the results I have presented as being in any way final. They were produced by firing four or five dozen blocks of the different bodies and taking the average.

Dr. ASH. There is one other point I wish to speak of, and that is with regard to grinding the surfaces of porcelain. I have fused and ground Jenkins body, and polished with a cuttletish disk, and after having seen this in the mouth for two years I have observed no change in its color.

With regard to crushing artificial teeth, and using the powder for inlays, I have tried that with no success at all. And I think this due to the fact that the artificial teeth are made from two different substances. They are made with a body on the inside, and an enamel on the outside, and when they are crushed you have a mixture of the two materials which will not produce satisfactory results. If these materials were separated I think you could get better results.

Dr. WHEELER. I will suggest that in order to get good results from crushing the artificial teeth the material must be crushed very fine, and if you will take this after crushing or grinding, place it in water, and remove that which floats on the water, then take that which sinks, and crush it again, going over this process several times, it will give a very fine material, enabling one to produce very smooth surfaces.

Dr. ASH. Dr. Spaulding of Detroit has obtained some very good results by crushing artificial teeth and separating the body and enamel, then baking a button of each to determine the shade, etc.

Dr. F. L. MARSHALL, Boston, Mass. In regard to porcelain bubbling, I have more trouble with the high-fusing than I do with the low-fusing body. When Dr. Capon speaks of any body being strong enough, I have to disagree with him. I have never yet found a body that was strong enough to stand all the strains in the mouth. In many cases, if you are building a corner you cannot have the body too strong. Dr. Wheeler speaks of using Parker's body. In 1887 I put in two corners on centrals, using Dr. Parker's body for the base, and Johnson & Lund's body and enamel to finish with, and those corners are there today in good condition. At the time when I used this body, Dr. Parker's

method was to take an impression of the cavity, run a plaster cast, biscuit the porcelain on the model, remove, finish and fuse, and grind to fit afterward.

With regard to the tests of strength of the different bodies, there are so many ways of applying pressure, and all so different from the strain we get in the mouth, that I do not see that much is gained by the comparison. What is strong enough for one mouth is weak in another, and I have never found anything in the shape of porcelain where there is a thin edge but is liable to break. For a number of years—I started in 1887—until a few years ago I used the high-fusing materials exclusively. Now I make a dozen inlays from the low-fusing body to one of the high-fusing—and I have a number of makes of the high-fusing bodies. The advantage is great in being able to use the gold matrix, and in places where there is no great strain the low-fusing inlays are as strong as needed, and will last as long as most high-fusing bodies in that place.

In regard to using artificial teeth and grinding them to a powder, I think it is absolutely impossible to get good results unless you flake off the enamel and use it separately to get the same color as the original tooth. My experience in inlay work is that a great deal of judgment must be used to get the proper shades. It is usually advisable to use a color either darker or lighter than the tooth, and not exactly the same shade. I have had better results in this line with the Jenkins body than with any other.

Dr. WHEELER (closing the discussion). I am very much gratified at the discussion of the paper, and I wish to say that my sole idea in reading it was to create an interest among the members of the society sufficient to persuade them to take up the investigation of the principles involved in porcelain work. I have no particular favorite in the porcelain bodies. What I have tried to do is to learn what is the best for the patient. I still think as I before stated with regard to the Jenkins body; I believe it has been tested long enough to make it sure that it is

not the best when it comes to strength and usefulness in the mouth. In any porcelain body the danger of disintegrating in the mouth is in proportion to the amount of alkaline salts used in the preparation of the body. I have not said that this disintegration would occur; I am only warning you that it probably would occur, and to be on the watch for it.

The only value that I attach to the tests for tensile strength is one of comparison. It does not show what will occur in the mouth, as the force there is in a different direction; but it does show comparatively the different strengths of the enamels, and gives us data upon which to work.

The question of bubbling is a question of chemical changes occurring, varying according to the quantity of these alkaline constituents. The greater the amount of these constituents, the lower the heat under which the color will disappear. A chemical change will take place, and it does not take place until

the heat has arrived at a point where it promotes a new combination of these alkaline constituents.

I must say that I have considered Dr. Capon an authority on porcelain work, and I listen with a good deal of attention when he says anything; but I disagree with him in regard to tapping producing a better texture in the porcelain. I have tried both methods many times, and I can get a more solid material from tapping than I can from pressure.

With regard to quick work, spoken of by one of the gentlemen, this is one of the warnings I wanted to sound to those who are beginning in this work. If my experience has taught me anything, it has taught me that you cannot do porcelain work properly and do it in a hurry. And I want to say, in closing: In doing porcelain work do not try to see how quickly you can do it. Take your time, and be very careful about every detail of the work, and you will get better results.

On motion the subject was passed.

(To be continued.)

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Thirty-fifth Annual Convention.

(Continued from page 394.)

THIRD DAY—*Morning Session.*

THE meeting was called to order at 9 A.M. by the president, and Dr. L. S. GOBLE read a paper on "Practical Sterilization for the Dentist."

The next order of business was the reading of a paper by Dr. H. L. BELCHER, Buffalo, as follows:

ORAL MASSAGE AND HYGIENE.

"In medieval times sanitation and diet were regarded as contrary to religion. The taking of medicine was sometimes forbidden as being a scheme to thwart

God's purposes." Even in this enlightened period, the greatest sanitary reform of the world (says Dr. D. D. Smith) lies in the Herculean task of revolutionizing the unsanitary and infectious condition of the human mouth.

Oral massage has received but little attention from the dental profession, notwithstanding its availability in diseased conditions of the oral cavity.

Douglas Graham, M.D., in a treatise on Massage, says that "Running water frees itself from impurities to a great extent, and unimpeded circulation may

well be likened to a running stream, doing useful work and keeping the machinery of the various districts of the body in motion and in health. A rapid flow, whether in a river, bloodvessel, or lymphatic, prevents the deposit of particles held in suspension."

The ills resulting from neglect or want of exercise are relieved by massage, which promotes a more rapid elimination of waste products and stimulates the sluggish peripheral circulation.

In incipient abscessed conditions, in alveolar atrophy, or in cases of sluggish circulation such as in congested and infected conditions of the gum and soft tissues, in pyorrhea pockets, etc., massage is of the greatest importance in stimulating the functional activity of veins and of lymphatics.

In pyorrhea alveolaris, by directing the forces from the extremity of the pocket toward its gingival opening, it serves an excellent purpose in that it tends to evacuate the pus. The transversely directed force gives greater opportunity for stimulation because of the possibility of greater friction. The ball of the index finger is easily applied on the labial and buccal surfaces, while that of the thumb may be used lingually.

Massage may be used to advantage after hypodermic injections to cause more thorough diffusion of the anesthetic fluid. It is also useful to hasten the eruption of deciduous and of permanent teeth. A gentle massage with the ball of the finger clears up the congested tissue, equalizes the circulation, etc. In various diseased conditions of the gum, the home treatment, if intelligently employed, is of inestimable value. The patient may be instructed in the rational employment of massage of the soft tissues, and exercise of the hard tissues.

Modern man lives an artificial life. He subsists on natural foods made by patented machinery, predigested foods, brain foods, thoroughly cooked and ready to eat, etc. The theory has been promulgated that it is not necessary to masticate the food for the stomach; and while advocating the value of prepared and predigested foods in certain pathological

conditions we must remember that in the healthy individual all the organs and viscera should be called upon to perform their physiological functions, and he whose teeth can masticate real food, whose ptyalin converts starch, and whose gastric, intestinal, and other digestive juices are called upon to fulfill their functions, is in a far more physiological condition than the spoon- or bottle-fed consumers of the concentrated and predigested nutrients so much lauded in the advertising columns of our journals and upon every city bill-board.

In the *Dental Review* for 1900, page 956, we read: "If the mouth of a healthy dog be examined the teeth will be found absolutely clean and the gums in a condition of glistly hardness. . . . This freedom from caries and looseness of the teeth is due solely to a diet which enforces upon the dog vigorous mastication. . . . The proper amount of friction upon the gums, either from mastication or artificially applied, would put an end to the ravages of that other enemy to the human teeth, namely, pyorrhea alveolaris."

In lame and congested conditions after severe and difficult extractions the muscles of the jaw are sometimes affected. Facial massage is here invaluable, the technique of which is as follows: (1) Smoothing from median line outward, following the course of the muscle as much as possible; (2) Superficial kneading; (3) Deep kneading; (4) Vibration; (5) Smoothing.

The smoothing is done with the balls of the fingers. Everything reaches a climax in the middle of the stroke. The stroke is begun lightly, and pressure is greatest at center of stroke, when it is gradually diminished to a very light touch again. You notice also that the order of treatment is most heroic in the middle of the stroke.

In stroking, the fingers are placed on the forehead first, rubbing outward from the center. This process goes gradually down the face, finishing under the chin. The kneading goes over the same course, moving the tips of the fingers in a circle, each time ending with a flourish.

The vibration is accomplished by placing the fingers, and then causing the forearm and wrist to vibrate.

In lame conditions of the muscles, the treatment should be the same as in the case of any muscle that is overtaxed, and as a rule should be preceded by hot water—cloths saturated in hot water and renewed at intervals for ten minutes. The hot water acts as a sedative to the nerves and also softens the muscle so that it can be worked more readily. Dr. Waters of Buffalo, an experienced masseur, tells me that in the muscles of the back, and in fact in all muscles of large area, the hot water is used for a half-hour, and that as much may be accomplished in one treatment with this addition as in three without it.

Dr. D. D. Smith's conclusion, after years of experience on patients only, is that caries of the teeth is a result of environmental conditions.* He theorizes that caries of the teeth begins at some point on the exposed enamel surface, and that it is primarily due to the affinity of the elements of the teeth for the acids of the menstruum in which they are continuously enveloped. Dr. Smith has developed a system of caring for the teeth. In detail, the process consists—to use his own words—of most careful and complete removal of all concretions, calcic deposits, semi-solids, bacterial plaques, inspissated secretions, and excretions which gather on the surface of the teeth, between them, or at the gum margins; to be followed by thorough polishing of all tooth-surfaces by hand methods. This treatment is frequently renewed. He says, further, that the tissues of the teeth themselves, especially the dentin and enamel, probably through stimulation of the vital forces of the pulp due to this treatment, begin a surprising change for the better.

Dull, opaque tooth-substance, often loaded with an offensive "old ivory" pigment, is transformed into clear, translucent tissue.

The salient feature to be emphasized

—at least from the standpoint of this paper—in Dr. Smith's procedure, is that he practically massages the teeth and gums with his orange-wood points, showing further that exercise is necessary for the health of the dental organs. Dr. Smith is not only right up to the minute, but he is a minute ahead.

Discussion.

Dr. A. E. SAGER, Rochester. I have nothing but commendation for the paper. I think Dr. Belcher goes a little farther in the massage treatment than even Dr. Smith. There is no doubt the massage Dr. Belcher suggests would be of great benefit in many diseases of the oral tissues, and especially so, I believe, in cases of pyorrhea; there are many cases of pyorrhea where this stimulation from massage would benefit the inflamed condition of the tissues. It occurs to me that the greatest difficulty with this character of work would be to educate the patients to a proper appreciation of their teeth and of this massage treatment. There is no doubt in my mind that, could we take charge of cases in time, we might do much toward preventing many of the oral diseases, and practically eliminate decay, but the difficulty is that we do not see the majority of our patients until trouble has started, and then something has to be done immediately. I believe that it would take only three or four treatments of this character to convince almost any patient of its value.

Dr. A. Osgood, Bath. I have no doubt of the effectiveness of the massage treatment as presented by the essayist; but one drawback, it seems to me, is the necessity for the patients to come to you so often. Some are willing to do this, but a great many are not.

The next paper on the program was one by Dr. C. H. LAND, Detroit, Mich., on "Extension for Prevention in Porcelain Work."

After reading his paper, Dr. Land exhibited several beautiful drawings illustrating his method of procedure as described by him in the DENTAL COSMOS for August 1903; he also presented for

* See *Dental Summary* for 1903, pp. 666, 667.

examination the case described in that communication.

Motion to adjourn was made and carried.

CLINICS.

On Wednesday no business session was held, the whole afternoon being devoted to clinics, and the evening to their discussion.

Following is a description of the various clinics:

Dr. C. C. BACHMAN, Waterloo. "The Replacing of a Broken Facing on an Anterior Lower Bridge." Dr. Bachman's method is to remove all pieces of porcelain from the pins where the facing is broken. Select a facing of the size and shade to replace the broken facing. Grind down the pins of the facing, then with a copper disk, wet with water and covered with carborundum powder, cut a groove in the back of the facing to admit the pins of the bridge; when the facing is fitted, make slight undercuts on each side of the groove, clean the facing well, and also the pins on the bridge; cement in place with good cement.

Dr. RICHARD KESSEL, Buffalo. "Construction of Crown and Bridge Work Without Heating Facings by Aid of the Lauderdale System, thereby Overcoming the Cracking of the Facings and Discoloration of the Same." For molars Dr. Kessel uses diatoric teeth, swaging a saddle over the lateral surface of crown with the Lauderdale system, leaving the grinding surface untouched, thereby showing hardly any gold. Use pure gold No. 34 gage for saddle, and complete your bridge in the ordinary way, only remove the facings until after the bridge is polished; then cement the crowns into place. For bicuspid use either diatoric or rubber teeth, and for anterior teeth use plate teeth.

Mr. ROBERT BREWSTER, Chicago. "Porcelain Work." Mr. Brewster demonstrated the advantage of three bodies in constructing a large contour inlay in a central incisor. The matrix was swaged in the Brewster press, two swagings producing a perfect-fitting matrix. The

foundation body was first baked into the matrix, then a dark color of enamel body was placed in the cervical end of the cavity and a lighter shade toward the incisal edge, but kept back from the extreme edge about one-sixteenth of an inch. Upon this baked surface a brown stain at about the center of the inlay was painted on with the clinician's high-fusing oil colors, demonstrating the value of these colors in reproducing such markings as are frequently found in natural teeth. Over this brown stain another layer of enamel body was baked, and over this a layer of XX enamel body, which was carried to the extreme cutting edge, giving to the finished inlay a most natural appearance. The clinic demonstrated the rapidity and accuracy of adaptation obtained in very large fillings by the swaging method.

Mr. Brewster also showed by his inlay technic system the light shrinkage of his gold-matrix porcelain, which fuses at the fusing-point of 14-k. gold, as compared with other low-fusing bodies, and by the high polish it takes, showing its absolute freedom from porosity.

Drs. C. E. and L. E. WETTLAUER, Buffalo. "Porcelain Inlay Work." The clinicians demonstrated the preparation of an approximal cavity in the right central and right lateral incisor for the reception of porcelain inlays, ample space having been secured for easy access by means of wedging; the inlay prepared for the central incisor being high-fusing body and for the lateral low-fusing body. When the inlays were placed in position prior to being cemented in, no perceptible difference in shade or adaptation could be observed.

Dr. A. S. BARNES, Oneonta. "Partial Dentures." The clinician said that to obtain perfect adaptation and a denture that would stay in place, lessen the amount of plate material, and do away with the flat clasp bands with their attendant evils. This has been the aim of many workers in prosthetic dentistry, and the clinician claimed that the method he advocates will overcome these vexatious problems. His method con-

sists in, first, obtaining a perfect plaster model; second, take a piece of round 18-k. gold wire No. 14 gage, and with pliers bend to partly conform to the lingual portion of the anterior teeth, allowing each end of the wire to extend beyond the bicuspid (if remaining) one-eighth of an inch. Flatten both ends of the wire and to them solder a loop of 18-k. No. 20 gage round wire. This is to allow the rubber to run through and hold the bar rigidly in position. It will be readily seen that the wire takes the place of the rubber which is usually made to rest against the lingual surface of the anterior teeth. The bar should not rest upon the tissues, but should be placed just above the gum margin.

The next step is that of making the clasps. Three clasps are made of 18-k. No. 20 gage round wire, bent so as to form a loop, and this loop is conformed to the buccal side of the tooth to be clasped so that the end of the loop binds the tooth. Spread each end of the clasp so that the rubber will hold it firmly in place. Place the teeth upon the model and wax into position. This is invested over both gold bar and clasps. If care be taken to invest properly, the clasps and bar will not be displaced when the flask is separated. Pack rubber under the ends of the clasps. Care should be taken to do this without disturbing the clasps. It will be seen that these round open wire clasps will not cause erosion or sensitiveness. No food will be retained by them, as so frequently happens with flat band clasps. The spring of the wire holds the plate in position, and the bar takes the place of the rubber.

Dr. F. M. Rood, Rochester. "The Use of a Screw to Support Pulpless Teeth." Dr. Rood demonstrated a method of strengthening the roots of teeth weakened through loss of tooth-structure, as in excavating to gain access to the canals, etc. He used for the support of these pulpless teeth an ordinary one-quarter-inch brass screw, anchored in the pulp-canal by means of amalgam.

Dr. C. W. LA SALLE, Rochester.

"Aluminum Lining for Rubber Plates."

The solvent used in this method consists of carbon disulfid 2 parts, naphtha 2 parts, chloroform 1 part, the chloroform being used simply to cover the odor of the other ingredients. The case is packed in the usual way, having just enough rubber in the flask to allow the same to come together under slight pressure, the palatal surface being as smooth as possible. Take a small swab of cotton saturated thoroughly with the solvent, and go over the palatal surface of the rubber. Dip the swab in aluminum bronzing powder, to be obtained at any plumber's shop, and apply to the rubber. This is repeated until no more can be applied, keeping the swab wet. Apply the aluminum powder dry to the model in the other half of flask, rubbing in thoroughly. Close the flask and vulcanize. After vulcanizing, cool flask thoroughly before opening. The clinician claims originality only in the application of the agents used. This method gives a lining homogeneous with the body of the plate, and one that requires but the use of soap and water to obtain a perfect finish. The clinician claimed that such a lining was prophylactic in the highest degree, no mucous deposits being able to attach themselves thereto, a feature which commends its general use in vulcanite work.

Dr. J. W. COWAN, Geneseo, demonstrated the use of Moss Fibre gold anchored in a molar crown cavity by means of cement, a very minute quantity of cement being used, gray in color, to enable the operator to see distinctly where the cement is placed. The filling is completed with No. 4 gold foil folded into ribbons and condensed by means of the electric mallet, a burnisher point being used to finish the filling.

Dr. H. W. ARTHUR, Pittsburg, Pa. "Ready-Made Matrices and Their Application." These matrices were made of sheet steel, passing around the embrasures to the buccal and lingual surfaces with a spur resting on the mesial or distal ridge of the occlusal surface. These matrices are applied by wedging firmly at the cervical third, the middle

and occlusal thirds being somewhat free, the lip resting on the mesial or distal ridge of the approximal tooth.

Dr. E. R. GRISWOLD, Dansville. "The Use of the Dam in Setting a Logan Crown." The root that is to receive the crown having been previously treated, the first step consists in slightly anesthetizing both lingual and labial portions of the gums. The dam is punched for the root and for one tooth on each side. This is done to allow setting of the crown to correspond with its mate. The root to be operated upon is first ligated, as this draws the septum of rubber separating the holes to a position between gum and tooth, protecting the gum. The ligature is forced up as far as possible, drawing tight and knotting, leaving sufficient floss to reach over the back of the head—or below the chin in the case of a lower tooth. A weight is placed on the floss, and the other teeth are ligated in the regular way. The root is then ground down as much as possible without cutting the floss, and the canal is prepared with a rose bur having a diameter equal to the width of the pin. The base of the crown is ground to fit the surface of the root, using articulating paper, until perfect adaptation is obtained. The next step is to make retaining grooves in the canal with a wheel bur, and cutting grooves in the pin with a separating file. The crown is set with high-heat gutta-percha.

By this method the clinician claims that the field of operation is kept perfectly dry, and laceration or bruising of the gum is prevented. With the method ordinarily used it is very difficult to prepare satisfactorily a root without much annoyance and loss of time during the fitting, owing to the flow of blood from the lacerated gum.

Dr. W. D. JACOB, Buffalo. "Taking Impressions and Arranging Teeth." For a base-plate some material should be used which is stiff and strong, and which will not soften by the heat of the mouth. Wax is objectionable, but modeling compound answers the purpose so far as taking the bite is concerned, and sheet wax

can be substituted for it when the teeth are to be arranged. The modeling-compound base-plate is made thick enough for strength, say about an eighth of an inch thick. A wax rim is added to the upper plate, and it is then placed in the mouth and trimmed to the proper length and fulness as usual. Then it is taken from the mouth and chilled. A wax rim is then added to the lower plate, and it is placed in the mouth while the wax is soft. The upper plate is then replaced and the patient instructed to bite until the lips meet. The lower plate is then removed and trimmed to the exact contour of the upper plate. This will make the lower lip a little too full in front when the plates are in the mouth, but this can be allowed for when the teeth are set up, the relative position of the teeth being more easily attained. But before this is done, the dentist must satisfy himself that the mandible is brought into the proper position for occlusion by the patient. Several expedients are resorted to for this purpose, the one which seems to be most successful being to instruct the patient to put the tip of the tongue against the palate when biting, carrying it as far back upon the palate as possible. A vertical line is now made in the wax rims of both plates in the mesial line, and a similar one on either side at the corners of the mouth. If the lower rim has been trimmed to the exact contour of the upper one, there will be no difficulty, if the above marks are made, in replacing them in their proper relation when they are removed from the mouth.

The next matter to be considered is the kind of articulator used. It is useless to expect uniformly good results in the articulation of artificial dentures with the common hinge articulator. These having only a hinge joint, with no provision for imitating the lateral movements of the mandible, good occlusion is easily obtained, but if the articulation is also good it is merely an accident. There is no way of arranging the teeth so that they will come into contact on both sides of the plate when the mandible is swung laterally, as in mastication.

tion, except by the use of the anatomical articulator, which is of the same proportions as the jaws, and which will imitate the lateral and protrusive movements. Even then the models should be set in the articulator in the same relation to its joints that the alveolar processes occupy in relation to the joints of the lower jaw. The position of the models in the articulator is often guessed at, and there is therefore some uncertainty as to results when an anatomical articulator is used. By using the Snow face-bow, however, the correct position of the models in the articulator can be assured, and a correct articulation of the teeth always obtained.

When the teeth are to be arranged, a wax plate is substituted for the upper trial plate, and the incisors, canines, and bicuspid are set up so that they conform to the edge of the lower trial plate. The plate should then be seen in the mouth, and the teeth so arranged as to give the proper expression. Then a wax trial plate is substituted for the lower one, and the lower second bicuspid are placed so that their cusps are received into the interspace between the two upper bicuspid. The lower first bicuspid are then added, then the first molars above and below, followed by the second molars, and as each pair is added their positions are tested by giving the articulator its lateral movements, and they are so adjusted that the teeth previously placed are not thrown out of contact with the upper ones; the molars are also in contact.

When the teeth are correctly arranged and the plates are placed in the mouth, there should be contact at several points whether they are brought together in occlusion or in any other position. When the lateral movement is given, the bicuspid on one side will touch at the same

time as the molars on the other. When the mandible is projected and the incisors brought into contact the molars will also touch. There will then be no tripping of the plates in mastication, and that function will be performed with greater comfort and facility than with dentures as they are usually constructed.

Dr. H. H. TOMPKINS, Utica, N. Y.
"A New Engine Bur for Inlay Work."

Dr. Tompkins demonstrated the use of a bur devised by him, with which cavities are easily and quickly shaped so that the walls are at slightly obtuse angles to the floor of the cavity. The bur is cone-shaped. The clinician preferred to shape his cavities in the manner referred to, claiming the following advantages over the usual saucer-shaped cavity: (1) Sharper and more defined walls, making an easier surface against which to build the inlay, and avoiding the thin, frail walls of the inlay made for the saucer-shaped cavity. (2) Avoidance of the constantly changing color in the frail edge. (3) Better retention, on account of the walls being nearly parallel, as this employs the friction of mastication as an additional retaining factor to that of cementation. (4) Mechanically, an inlay more difficult to displace, as it would have to be pulled bodily from the cavity, whereas in the saucer-shaped cavity the inlay is easily displaced by the impact of food catching at the margins.

The clinician also exhibited a bur, called the "undercut bur," used to quickly reduce the unretentiveness of saucer-shaped cavities by giving to them a form that will easily hold a metallic filling. He claimed that by the use of this bur the cavity is more quickly prepared, and the walls of enamel are supported by dentin, the enamel rods being cut perpendicularly to the dentin.

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EDITORIAL DEPARTMENT.

SPELLING.

IN the consideration of the preparatory training most desirable as a foundation for the dental professional course it would seem that more attention could be profitably given to the question of language. It must be evident to those engaged in teaching or in editorial work that the comprehension of language evinced by the average high-school graduate is woefully deficient, and that this deficiency is a material obstacle to professional success.

It was told of the late Bronson Alcott, we believe, that in answering a letter from a young man desiring his counsel as to further education and whose orthography was of a strictly original character, he advised the young man first of all "to go to college for a spell."

The practical utility of this advice has apparently lost none of its forcefulness in the lapse of time, for good spelling seems to be the exception rather than the rule nowadays.

The writer has been at some pains to investigate the causes of the present widespread laxity in the matter of spelling indulged in by those who have completed their systematic studies of this subject; and it is surely important that something should be done in the way of instituting a reform in the conditions which lead to this abominable misuse and mutilation of our mother tongue.

Inquiry of those who habitually disregard the recognized standards of orthography reveals a general lack of appreciation of the importance of

correct spelling, and what is more, a fundamentally faulty method of study resulting in an equally faulty conception of the meaning of language.

As a consequence, the ability to accurately record or convey by writing one's thoughts becomes impossible, the defective method often leading to misunderstandings fatal at least to the object intended.

The statement is frequently made by way of excuse for bad spelling, that the ability to spell correctly is a natural gift or endowment—that those with an accurate tone sense, for example, take naturally to correct spelling. While we may admit this to be a factor, it is undoubtedly of minor importance as compared with the question of a correct mode of teaching and study. The primary fault appears to be in the false idea held by many that a word may be spelled almost any way provided it conveys the suggestion of what is meant, and such a view initiates and maintains a method of spelling based solely upon the ability of the individual to memorize abstract combinations of letters representing certain sounds intended to convey an idea. It may have been this mistaken view which gave birth to the statement of Talleyrand that words were intended to obscure thought. Without a conception of the individuality and character of words based upon their derivation and primary root meaning, spelling becomes an unadulterated effort of memorizing of greater magnitude than the average mind can compass.

The composite character of English makes some knowledge of other tongues a necessity. To no language can Goethe's dictum, "He who speaks no foreign tongue does not know his own," be more truly applied than to English. Derived largely from Latin, Greek, Saxon, and French, to know English well one must know at least something of the languages from which it has originated. It is this knowledge of its ancestry and the mutations through which our language has passed that constitutes the difference between knowing words and memorizing them. It is rationalism as against empiricism in language, and thus good spelling as against bad spelling.

When the so-called "reform movement" in education some two decades or more ago gave a distinctly minor place to the teaching of spelling, it struck a blow at the rational and precise use of language which was a serious handicap to the present generation; not only because of the inaccurate spelling produced in consequence, but by depriving the student of the disciplinary training in the precise use of language—that respect for accuracy in the use of words which is not only important in itself but of value in establishing truth and accuracy as elements of character.

With the back-seating of spelling as a study the adjuncts thereto were similarly treated. Notably the training in etymology required of grammar-school students was dispensed with on the assumption that the two or more years of high-school Latin would be an efficient substitute. This in our opinion was an error. The high-school Latin doubtless has value in that it develops an understanding of grammatical construction, throws considerable side light upon the derivation of many English words, and is useful

as mental discipline, just as all study is useful in this latter feature. The two or more years of high-school Latin does not, however, fill the useful position which the same period of study devoted to the old-fashioned etymology fulfilled in illuminating the mind of the student as to the origin of words and the modifications of which the radix was capable by variations in prefix and suffix. The information thus derived was such as to indelibly fix in the mind the form as well as the meaning of words; it gave a vitality to language and an insight into its meanings totally impossible in connection with a hard and dry process of word-memorizing. The smattering of Latin of the average high school is not and never can be a fair equivalent for the old etymology course. The etymology was an epitome of the root words which Latin has contributed to our language, with lists of their principal derivatives. It was an epitome of the contributions of Latin to the English tongue which would require years of the systematic study of Latin to acquire.

We advocate a return to that system of instruction in preparatory schools which produced a larger knowledge of English and its more accurate use. The training of dental students would be a much simpler matter and their power to comprehend instruction would be enlarged if they had received a better knowledge of the meaning of words—not the technical terminology of their profession, but of the vocabulary of the average cultivated man. They should be taught that words are work-tools—more than that, they are instruments of precision—and that their misuse is an offense against truth and accuracy as objectionable as the use of a chisel for a screwdriver.

Dental teachers have constantly felt the handicap of defective language training in their classes, and the demand for higher standards of preparation is constantly made. But “higher” does not necessarily mean longer, though it certainly means better preparation. No amount or length of bad training will cure the defect here under consideration; the time already devoted to language in the preparatory courses is probably sufficient. What is needed is a more intelligent method and a clearer appreciation of the purposes and ends for which language is taught. Some extra care given to this matter would not only greatly minimize the execrable spelling with which dental teachers are afflicted, but would produce more intelligent and more cultured recruits for the ranks of dentistry.

OUR FRONTISPIECE.

THROUGH unavoidable circumstances we have had to postpone until this issue the publication of the portrait of the late Mr. James Smith Turner. An obituary notice of this eminent practitioner appeared in our June number.

FOURTH INTERNATIONAL DENTAL CONGRESS.

WE print in this issue (see page 612), notice of a special train intended to accommodate American members from New York, New Jersey, New England, Buffalo, Canada, and Cleveland, with any from Philadelphia who may wish to join the party either at New York or Buffalo, in going to St. Louis to attend the Fourth International Dental Congress. Similar trains will be provided for those going directly from Philadelphia, Washington, and Baltimore and vicinity, due notice of which will be given in our next issue.

We desire here to call attention to two points concerning which considerable inquiry has been made and about which there is evidently no little misunderstanding. First: By authority of the Local Committee of Arrangements we are glad to be able to officially state that the misapprehension with regard to excessive hotel rates in St. Louis is absolutely without foundation. The report of the local committee with regard to this matter will be found at page 602 of the present issue. Further: We are informed that state committeemen and others concerned in the collection of contributions have in certain instances met with inquiries as to the disposition of the funds that are being collected to meet the expenses of the Congress, and in some instances reluctance to contribute lest the general expense fund should be used for social entertainments, junketings, and expenditures not legitimately a part of the work of this great international gathering.

It is estimated that in order to pay the actual expenses attendant upon the holding of this great meeting, the cost of printing, the cost of issuing the Transactions, and the legitimate expenditures of the several committeemen for postage, stationery, and clerical services, from thirty-five to forty thousand dollars will be required. Thus far, all of the expenses incurred by the members of the Committee of Organization have been met by their own personal contribution, and (with but few exceptions) so also for the expenditures of the state committeemen. No provision for the payment of the cost of entertainments from the general expense fund has been authorized by the Committee of Organization. At the general banquet of the Congress it is proposed that those members coming from abroad shall be entertained as the guests of the American members, the cost of the banquet to be borne by the American members participating therein on the subscription plan.

Let it be understood that the Committee of Organization is pledged to the faithful performance of its duty, no unimportant part of which is the judicious and equitable expenditure of the fund which it holds in trust for the best interests of the dental profession in carrying out the high purposes of the Fourth International Dental Congress.

BIBLIOGRAPHICAL.

NOTES ON THE TREATMENT AND FILLING OF TEETH. By WILLIAM CASS GRAYSTON, L.D.S. Second Edition. London: The Dental Manufacturing Co., Limited, 1904.

After carefully reading the contents of these "notes" we have reached the satisfactory conclusion that the work answers truthfully the purpose which the author intends it to fill, viz, that of a comprehensive compilation of useful points on operative dentistry.

Little works such as the one under consideration—which, by the way, do not belong to that class under which manuals and compends are classified—must necessarily render valuable service to the beginner in operative dentistry, and likewise to every young practitioner desirous of familiarizing himself with the successful methods of advanced men—of those who by reason of favorable circumstances have had the opportunity to test the value of different procedures and to

select therefrom those best adapted to the needs of the busy dentist. It brings, indeed, a most refreshing feeling to have before one's eyes a work embodying the clinical results of years of continuous research, especially at the present time when the market practically swarms with treatises which portray the ability of their authors as compilers rather than as investigators.

The book before us is divided into six chapters, embracing the following subjects: Chapter I: Relief of Pain. Chapter II: Removal of Tartar. Chapter III: Pyorrhea Alveolaris. Chapter IV: Filling Teeth. Chapter V: Porcelain Inlays. Chapter VI: Treatment of Diseased Conditions of Teeth Preparatory to Filling.

We commend the book for the valuable practical suggestions it contains, feeling that it will render excellent aid of the character above alluded to.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Dental Review*, May 15, 1904.]

THE GOLD INLAY. By W. N. MURRAY, MINNEAPOLIS, MINN.

The author advocates the use of gold inlays in the following cases:

First: In devitalized molars and bicuspid, because the frail walls that exist in those cases can be better protected with the gold inlay than with any gold filling that can be inserted in those places.

Second: In distal cavities in upper and lower second molars, because if the same amount of skill necessary to insert gold fillings were expended upon inlays, the result

would be far more satisfactory to patient and operator.

Third: In children's teeth where the use of gold is indicated.

Fourth: To fill cavities in the teeth of aged people, teeth that have become loose through the ravages of time and disease. The technique of the operation is as follows: All approximal cavities should be prepared in such a manner as to admit of the removal of the matrix from the occlusal surface only. In all approximal cavities, wherever the tooth-structure will admit it, a dovetailed step should be resorted to, and in cases where this procedure is not possible the enamel

walls beyond the cusps should be beveled to prevent the cusp of the matrix moving toward the approximal surface. The cervical walls should be flat and the approximal walls at right angles with the former. The matrix is prepared with rolled gold No. 40. To prevent the possibility of any solder flowing upon the outside of the matrix, it is coated externally with rouge dissolved in alcohol. The matrix is then invested in sump. The solder is then flowed into the matrix.

[*Odontologie*, Paris, May 15, 1904.]

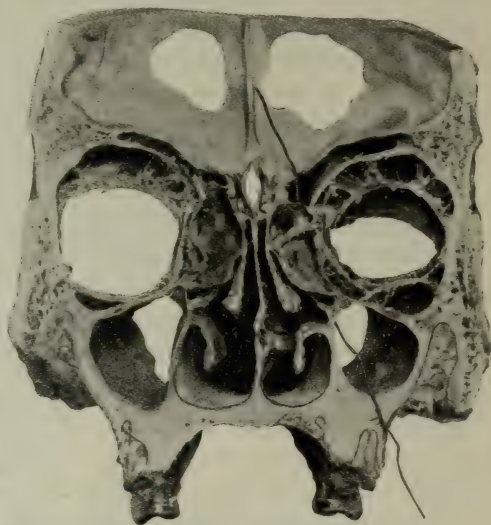
MAXILLARY SINUSITIS WITH INFRA-ORBITAL FISTULA. BY DR. VICHAT, LYONS, FRANCE.

The author reports the case of a patient, a girl aged sixteen, who sought his services for the treatment of an infra-orbital fistula and edema of the cellular tissues of the right cheek. A careful intra-buccal examination and a group of subjective symptoms led him to a diagnosis of maxillary sinusitis. Severe cephalalgia and a pyogenic discharge through the nose were the concomitant manifestations. The onset of the disturbance had been marked by odontalgia of short duration, and was followed by inflammation of the cheek, tumefaction of the eye, and febrile disturbances.

At this stage a physician was called in and directed the application of hot poultices. His orders were strictly adhered to and resulted in the abscess breaking through the face with the formation of a disfiguring fistula. The case was then referred to the author, who found upon examination that the empyema had been caused by an infected root protruding into the antral cavity. The offending tooth was extracted and a large opening into the sinus was secured. Into this cavity an injection of tepid water was next made, and resulted in the discharge of a quantity of fetid pus through the nose. After the sinus had been cleaned out, the infra-orbital fistula was freed of the decomposed matter lodged at its entrance, and an antiseptic fluid was forced through it, which once more resulted in an amount of pus and disorganized tissue escaping through the nostril. A free drain from the sinus was then established by means of a gold cannula maintained *in situ* by the aid of two clasps adapted to each tooth on either side of the alveolar opening. The sinus was washed out repeatedly with hydrogen dioxid, at first diluted and eventually in full strength.

The result of this treatment was satisfactory.

In this connection the reviewer considers it necessary to raise a word of warning on the use of hydrogen dioxid in the treatment of infected cavities and in all places in which there is a likelihood of the infectious material being forced beyond the original limits of the inflamed area. In the case of antral empyema the injection of hydrogen dioxid might result in the pyogenic exudate being forced into the frontal sinus, giving rise to a suppurative inflammation of those cells and possibly to cerebral meningitis. If a sufficient quantity of H_2O_2 be injected the pressure caused by the liberation of oxygen, besides causing disorders of trophic nature, would force some of the infected matter into the frontal sinus by way of the hiatus semilunaris and its continuation the infundibulum. The relations of the frontal and maxillary sinuses



are plainly shown in the illustration here reproduced from Dr. Cryer's work, "Studies of the Internal Anatomy of the Face." This is a posterior view of a vertical transverse section of the head in the region between the second premolar and first molar, showing a wire passing from the frontal into the maxillary sinus.

The reviewer is personally aware of several cases in which hydrogen dioxid has been the cause of results such as above described, but recalls one in particular, reported at the last meeting of the American Academy of Medicine, in which the injection of this agent within an infected mandibular alveolus resulted in an osteomyelitis of that half of the mandibular bone in which the socket was

located. Two other typical cases which came under the observation of Professor Cryer, of the oral surgical department of the University of Pennsylvania, will now be described:

Case I. Mrs. A., age forty-five; previous history good. Consulted a dentist for the treatment of an infected lower second bicuspid. The canal was opened and hydrogen dioxid was injected. The degree of pressure produced by the liberation of oxygen from H_2O_2 forced some of the infected debris beyond the apical foramen, setting up an inflammation in the periapical region. As the original pain and distressing phenomena did not subside, the tooth was extracted, when it was found that a considerable area of cancellated tissue near the mental canal and foramen was in a necrotic condition. The disorganized osseous tissue was curetted away, and again hydrogen dioxid was injected through the alveolus. This treatment was continued for over six months, but as no improvement could be perceived the patient was referred to Dr. Cryer. He removed a portion of cortical bone and found that a silver probe could be passed backward under the molar teeth as far as the ramus and forward to the symphysis. The whole cancellated structure in that half of the mandible had undergone a necrotic process. Knowing the exact cause of the trouble, a treatment in harmony therewith was instituted, and very soon thereafter the case was pronounced cured.

Case II. Young man, age about twenty-two. Had an infected upper second bicuspid, with its root protruding into the antrum and beneath the muco-periosteum. The tooth was opened and hydrogen dioxid injected. Here, again, it produced inflammatory phenomena in the muco-periosteum. More H_2O_2 was injected, and this time it is probable that some of the infected matter was forced through the ostium maxillare into the hiatus semilunaris, thence to the frontal sinus, and from there through one of its openings into the brain-case, giving rise to meningitis. Removal of the cause and free drainage brought about a cure.

These cases clearly illustrate the conditions the reviewer has endeavored to bring out, and it is to be hoped will serve as a warning against the indiscriminate use of the oxidizing agents.

[*Items of Interest*, June 1904.]

INSERTION OF ARTIFICIAL DENTURES.

By L. P. HASKELL, CHICAGO, ILL.

The author is of the opinion that students are often confused with too many methods.

The instructor should confine himself to a well-established and simple method of his own which he knows to produce satisfactory results.

Discussing the use of vulcanite, Dr. Haskell states that its chief objection is its non-conductibility, bringing about changes in the alveolar process in at least eighty per cent. of mouths. The truth of this theory has been established after close observation in the use of rubber for more than forty years.

The first requisite in the construction of an artificial denture is a plaster impression taken high over the canine eminence. Carefully filled, the model from this impression should be so shaped that it will drop readily from the mold.

The author then discusses the question of adhesion of the plate to the jaw, stating that the palate is the only portion of the jaw which does not change, while the alveolar ridge is subject to change, especially under rubber plates, owing to the retention of undue heat. Unless provision be made for this change, it is only a question of time when the plate will rock over the hard center and there will be constant displacement of the denture. If the usual vacuum cavity be used, the anterior and posterior margins will rise and rock. The remedy for this defect in metal plates consists in placing a thin film of wax with undefined margin over the hard palate from near the top of the ridge to within one-fourth of an inch of the posterior margin of the plate, which should be extended farther back than is usually done. The hard condition of the palate is found in ninety-eight per cent. of jaws, while in two per cent. there is a soft condition, usually accompanied by a crevice. In these two per cent. of cases no change of model is needed, but the plate is fitted snugly to the whole surface of the palate.

The author then suggests the use of oiled sand, because it is always ready for use, and avoids the necessity of moistening the sand whenever a die is to be made. The lard oil is preferred, as with it the sand does not cake and no sifting is required.

For the making of dies, Dr. Haskell uses an alloy, composed of copper one part, antimony two parts, tin eight parts. This alloy, known as Babbitt's metal, cannot be used in conjunction with lead without danger of uniting. Counter-dies he makes of an alloy of tin one part, lead five parts. The die is coated with whiting, and the lead is not poured until it begins to thicken.

To avoid the use of copper in full upper dentures, when the patient cannot afford gold or platinum, aluminum is the metal here advocated. The essayist has used it for many years, and finds no objection to it. The plate should be at least No. 20 gage, and the attachment always by the use of the loop punch. In swaging this metal, as it is soft and will tear easily, the portion of the counter-die which closes into undercuts should be cut away. The mallet should not be used on the palatal surface, but instead a pad of wet paper is employed to drive the plate into place.

[*International Dental Journal*, June 1904.]

A REVIEW OF SOME METHODS OF CROWNING TEETH. BY GEORGE F. GRANT, BOSTON, MASS.

This paper contains some very interesting items on the construction of substitutes for natural crowns. Beginning with the pin or post, we find that the author considers platinized gold and platino-iridium as the only materials suitable for the construction of this portion of the crown. The porcelain and platinum banded crown is here advocated as being the least liable to fracture of any crown made. There is, however, one point likely to give trouble or impair its appearance; that is, that the enamel is very likely to flake from the band, probably caused by vibration in use.

Regarding the use of bands, the author questions their value, especially in the case of good healthy roots. Here the band is rather a doubtful factor, and it is better, in the author's opinion, to depend upon a perfect joint at or near the gum margin. This can always be assured by placing a piece of pure gold about No. 60, or ribbon gold, if preferred, upon the prepared root, perforating and passing the post through it into the root, and if the perforation be made smaller than the post, plate and post may be withdrawn together in their proper relation, and soldered over a Bunsen flame. The soldered piece is replaced upon the root, and the gold is then malleted just as in the condensation of a filling.

The author next describes his method of making removable crowns, which consists in setting with cement in the root a square tube or socket into which a post has been previously fitted. The post is withdrawn after the cement has hardened, passed through a perforated gold base, and the operation completed as in the case described above.

[*Medical News*, New York, March 12, 1904.]

A FACTOR IN THE ETIOLOGY OF DISTORTED NASAL SEPTA. BY CHAS. E. QUIMBY, M.D., NEW YORK.

At the very beginning of this paper we are confronted with a statement which, in our opinion, is out of place in any dissertation in which the ascertainment of the relations of cause and effect should constitute the main purpose in view. Facial, oral, and dental malformations—and for that matter any developmental error—are unquestionably the immediate or remote consequence of some force, the nature of which is obvious in some cases, while in others it remains hidden and beyond the grasp of rational explanation. Therefore, to attribute to "chance" the cause of a human malformation implies a re-migration to the past eras of mysticism, alchemy, necromancy, and the numerous other occult specialties of the middle ages, and a divorcement of biology from the realm of science. The statement in question is as follows: "Deflected and distorted septa are in many cases developmental defects, and require no other explanation than *pure chance* [*italics ours*]. It is understood that cases involving definite new growth of either cartilage or bone are not included."

Many malformations which become evident years after birth are doubtless the results of embryological errors, and while their immediate cause may be obscure and problematic, yet the fact remains that at some time during the developmental period a given force made its appearance which being greater than the resistance offered by the immature cellular elements and the physiological forces concerned in the process of growth, brought about certain changes which later in life must be made to account for various malformations. The purpose of these remarks is mainly to eliminate the element "chance," which term is meaningless wherever found, and particularly when tending, as here, to destroy the relationship of cause to effect.

The author recognizes the high and V-shaped palate as a factor in the causation of distorted septa, and adds that "A narrow alveolar arch and asymmetrical facial development are found most frequently in association with triangular-shaped teeth and varying grades of irregular dentition, but seldom with the straight-edged teeth and regular dentition." We are in the dark as to the meaning of triangular-shaped teeth, but presume that it refers to the arrangement of the teeth in the arch rather than to their individual form or general appearance.

The effects of inflammatory changes in the septum resulting from injury are also considered by the author as probable causes of nasal distortion, but it is upon the relation of irregular maxillary development to the shape and direction of the septum that the author dwells in particular. Dr. Quimby then describes a case in which a distorted nasal septum with all its concomitant symptoms was successfully treated through widening of a V-shaped palate, thereby straightening the septum and removing the obstruction to nasal breathing. To judge from some of his questionable views on orthodontia technique, we agree with the essayist that such cases should be treated by the dentist in collaboration with the rhinologist, instead of by the rhinologist alone, as was here the case. *Ne sutor ultra crepidam.*

J. E.

[Dental Summary, June 1904.]

IMPRESSIONS OF THE MOUTH. By A. O. HUNT, OMAHA, NEB.

The purpose of an impression is something more than securing a model upon which a good arrangement of the teeth, a good adaptation, or a good occlusion or articulation of the teeth may be obtained, essential as they are. Though all this be attained, yet if the features are not restored to as good or better condition than once prevailed, prosthesis is not effected. The smallest detail in the process of taking an impression has an important bearing on the final result. The loss of natural teeth brings about changes of considerable magnitude in the expression of the human face. The loss of the canine, upper and lower, destroys at once the actions of the muscles of expression in their relation to the orbicularis oris muscle. The further resorption of the eminence over the roots of these teeth precludes the possibility of a complete restoration to the normal conditions. Incidentally, the author suggests the practice he has long followed in preserving the roots of these teeth *in situ* by filling and capping on a level with the gum tissue. The canine eminence is continued with the form of the root, and extends so much above the union of the lip and the gum under the orbicularis oris muscle that when this eminence is obliterated it is impossible to secure an impression of the part sufficiently high up to make the restoration complete. The fibers of the orbicularis oris muscle ride over these eminences much as a rope runs through a pulley-block, controlling in this way the movement of all the muscles of expression. Another change occurs in the posterior part of the mouth, in

the dropping down of the buccinators, carrying with them the whole tissue of the cheeks. The resorption of the alveolar border aggravates this, and causes a falling inward of the tissue. The muscles of expression are all affected by this change, particularly at their insertion in the orbicularis oris.

One of the difficulties met with in the retention of upper dentures is that they have a tendency to drop down or away from the palate and ridge of the mouth. In the author's experience, this is not due to a lack of close adaptation to the mouth, but rather to a faulty impression of the other parts relating to the position and function of the muscles.

The author describes some of the changes that may be brought about in the function of the muscles of expression, and suggests that a careful examination be made of all that can in any way interfere with the retention of a denture in position when the functions of the different parts of the oral cavity are in action, as well as to utilize any muscles or portions of muscles that may assist in such retention.

A method of examination for the upper and external surface of the lower jaw should consist, first, in lifting the lip upward, outward, and downward, moving the muscles in every direction to their fullest tension, and noticing the changes which they assume as they are placed in different positions. A careful and digital examination should be made of both the soft and the hard parts of the mouth, and a record made, not only of their location, but of their form.

Impression trays for the upper jaw should be well adapted to the parts, so that when securing impressions the margins of the tray should be full and strong enough to carry back to their position the fallen muscles, particularly in the buccinator region. While the impression plaster is in position and yet sufficiently plastic, direct the patient to open the mouth to the fullest extent, meanwhile holding the tray firmly against the palatal portion, with the fingers out of the way of the full action of the muscles controlling the movements of the angles of the mouth. While in position, grasp the corners of the mouth and move the attachment of these muscles backward and forward to accentuate their depression and movement at the margin of the impression; also manipulate the anterior portion of the frenum in the same manner. When the perfected model is ready, the margins for the denture will be distinctly indicated, except at the posterior palatal margin, which should be imbedded in the soft tissues.

The same care should be exercised in examining the parts for the lower impression. When the tray is in position, the patient is directed to protrude the tongue along the handle of the tray. Direct your patient to open the mouth wide, and manipulate the muscles as before. Pull the lower lip upward and forward without allowing the tongue to drop back on the tray. By this means the

fullest action of the mylo-hyoid and other muscles of the interior and floor of the mouth are reproduced in the margin of the impression.

One essential feature in getting the impression is forcing upward and downward the union of the cheeks and lips with the gum tissue to a normal position, which will carry with it the fallen and displaced muscles.

PERISCOPE.

To Prevent Adhesion of Very Soft Cement to Instrument.—Smear the instrument with phosphoric acid before allowing it to come in contact with the cement.—A. M. WAAS, *Dental Review*.

Quick Pickle.—Place work in a glass and nearly cover with hot water. Pour in as much pure sulfuric acid as you have water, and by this time your piece will be clean.—OLIVER MARTIN, *Dental Review*.

To Remove Oxid from German Silver Regulating Appliances.—Hydrochloric acid, cold, full strength, may be used to remove oxid from German silver regulating appliances.—V. E. BARNES, *Dental Summary*.

Thrush.—Illoway reviews some of the dangers that may follow neglect in the treatment of thrush. Nothing gives such brilliant results as a twenty-five per cent. solution of the tincture of iodine in glycerin.—*New York Med. Journal*.

Syringing the Mouth.—It took years to teach me that in syringing the mouth, the less one interferes with the free action of the muscles the less likely the water is to run out at the corners.—MARK G. MCILHINNEY, *Dental Review*.

Reduction of Fractures.—When a fracture cannot be perfectly reduced and the parts brought into good approximation, it is pretty nearly malpractice to be satisfied with our efforts until we have tried anesthesia to the full surgical degree.—*Internat. Journ. of Surgery*.

Trephining with Local Anesthesia.—Heidenhain has operated upon two patients—removing in one instance a sequestrum, in the other trephining for a sarcoma of the motor region—under local anesthesia, using Braun's solution, a one-half of one per cent. solution of cocaine with the addition of one or two drops of a one-tenth of one per cent. solution of adrenalin.—*New York Med. Journal*.

Uses of Cement.—As a cavity lining, for purposes of anchorage, to secure perfect adaptation, as a non-conductor, to strengthen frail walls, to prevent discoloration from amalgam, to avoid cutting for retention in sensitive dentin, to prevent shrinkage of amalgam from cavity walls, and to save time for both patient and operator.—J. J. REED, *Dental Brief*.

A Danger of Adrenalin.—Neugebauer reports that he has seen several cases of localized gangrene following the use of solutions to which adrenalin had been added for the infiltration method of local anesthesia. Elderly persons were especially liable to this, and he therefore cautions against the use of adrenalin in old persons.—M. I. WILBERT, *American Journ. of Pharmacy*.

Lupus Treated by Local Applications of Turpentine.—During the past year, Hoy (*Cincinnati Lancet-Clinic*, December 12, 1903) has treated several cases of lupus with local applications of turpentine. Picric acid gauze or cotton was employed to keep the ulcer moistened with the turpentine. The lesions healed rapidly and satisfactorily in every case and have not recurred.—*Therapeutic Gazette*.

Extension for Prevention or for Retention?—I believe the matter of extension for retention is of subordinate importance. I think extension for prevention is the keynote of the problem. In extension for prevention we always have greater stress, but we know that very many times when we have made extension for prevention without the thought of retention, we have found we have had much better success in saving the tooth than we have when we have made the extension for retention and not for prevention.—E. O. FRENCH, *Dental Summary*.

Severe Discoloration of the Skin following the Injection of Adrenalin.—Schucking (*Münch. med. Wochenschrift*, January 26, 1904) has used his preparation with good results in plastic operations, but believes it increases the post-operative nausea. In one case, after 1½ cc. of a 1:100 solution had been injected the patient's skin acquired a deep bluish-black color resembling that of Addison's disease and lasting half an hour. The pulse remained palpable, but respiration became shallow until artificial respiration was used.—*Med. Times and Hosp. Gazette*.

Sterilizing the Hands.—How long shall we wash our hands before operating? The only answer to this is that we can never wash them long enough, since there is evidence that we have no means of entirely sterilizing them. Rubber gloves form the only logical remedy, and should be always used unless there is good reason to avoid them, either because the operator cannot as easily feel tissues and handle needles with them, or because the surgeon is so careful of his hands that he has a legitimate belief that they are as nearly sterile as possible.—*Internat. Journ. of Surgery*.

Tin for Filling Purposes.—Tin has many of the desirable qualities of a filling. It is quite compatible with tooth-structure, but it makes an unsightly filling, and has—of late years at least—not had many advocates for the class of cavities before mentioned. The cements are excellent filling materials in most respects, both in appearance and compatibility, but, as you all know, they are unreliable because of their solubility in the fluids of the mouth, requiring closer attention than most dentists are permitted to bestow upon their young patients. I have seen so much harm done by the neglect of cement fillings that I seriously question the wisdom of using it as a filling material for these cases. However, this much can be said, that as long as the cement lasts it is nearly the ideal filling.—E. H. ALLEN, *Dental Review*.

Osteoperiostitis of the Superior Maxillary.—Pont and Leclair cite a case in which the abnormal persistence of the temporary molars had excited rather serious symptoms of periostitis and osteitis. This condition was found to be due to the unusual shape of the secondary teeth, which were seeking to push their way through, and which were found to have their customary circumferences as to crown and root reversed. This condition may not be unusual, and dentists or physicians who are consulted regarding the delay in the appearance of the permanent teeth may well take it into consideration.—*New York Med. Journal*.

Maxillary Sinusitis due to a Dental Ectopia.—Guizez reports (*Ann. des Mal. de l'Oreille, du Larynx, etc.*, February 1904) a case in which the suppuration of the maxillary sinus was found to be due to a large molar tooth in its interior, the roots being implanted partly in the alveolus and partly in the floor of the sinus itself. This tooth was carious at the union of the neck and roots. For its liberation it was necessary to resect a portion of the alveolar process and the palatal vault. A slight buccal fistula presented for several weeks, but the purulent discharge and the subjective odor completely disappeared.—*Amer. Journ. of the Med. Sciences*.

Operations Performed for Children.—The operations which we perform for our child patients must necessarily consist of those that are simple and nearly painless. Extraction is seldom called for until nature has nearly completed her efforts to cast off the temporary teeth. No pains or effort should be spared to avoid everything in the nature of bodily or mental suffering, and we can console ourselves in some measure for the loss of time and money by remembering that we are paving the way to greater ease and saving of time to both patient and operator through the added care, kindness, and skill which must be exercised in this class of work. Every careless infliction of pain, every thoughtless exhibition of impatience, every frown or harsh word is like foul seed sown upon good ground. It will surely bear fruit of the most distasteful kind, and must eventually make our work harder and our failure in after years more pronounced. Every kind word and act, every lost moment and every self-sacrifice, if judiciously expended, will just as surely return to us like bread cast upon the waters, and will insure everything that is desirable in the later years of practice.—CHAS. A. VANDUZEE, *Dental Summary*.

Adenoid Operations and Mortality.—Not long since I was asked to see a case in consultation in which purulent meningitis had developed after an operation for adenoids. The termination of the case was, of course, fatal. It seems probable that there are many more fatalities after adenoid operations than are reported, or than there are usually considered to be. Some time ago I saw a similar case in a young adult of twenty years, suffering from a typical acute infectious meningitis after operation. It seems not unlikely that in these cases the removal of the lymphatic tissue leaves lymph-passages open for the absorption of infectious material of various kinds which, owing to conditions, is practically always present in the throat.—*Medical News.*

Swaging Plates.—In the swaging of plates Dr. Haskell says he only requires one set of dies—the lead counter-die and the Babbitt metal die. One set of dies in my hands would be an utter failure. It depends, of course, on the kind of plate I am swaging. If I use a gold plate I want at least three sets; if it be platinum I want two sets. Instead of using Babbitt metal I have an alloy which I prefer, composed of one part of bismuth and six of tin; in that one has a metal that gives exactly the counterpart of the model. I make the counter-die of lead. If you re-melt lead it becomes hard, and you want a soft bed to swage against. A horn or copper driver—a small one, perhaps one-quarter or three-eighths of an inch in size—should force the metal into every crevice of that die.—JOHN H. MEYER, *Items of Interest.*

Classification of Cavities where Porcelain is Indicated.—This may be as follows:

(1) All cavities on the labial and buccal surfaces of the teeth. (2) All simple approximal cavities on incisors and canines. (3) Proximo-incisal cavities, if the cavities can be so prepared that the retentive resistance will be greater than the stress. (4) Cavities involving all or a portion of the incisal edge. (5) Deep cavities on the occlusal surfaces of molars. (6) Proximo-occlusal cavities of bicuspids and molars, provided a large enough mass of porcelain can be used to withstand the force of mastication. (7) Cavities involving the entire occlusal surfaces of molars.

The contra-indications for porcelain inlays are these: (1) In those cavities where stress will dislodge the filling or cause it to fracture. (2) In all cavities where it is impossible to construct a good matrix because of the inaccessibility of the cavity. (3) On incisors which are thin labio-lingually through the incisal third.—J. Q. BYRAM, *Dental Summary.*

Guiding Patients in the Care of Their Teeth.—My personal experience in everyday practice leads me to feel greatly encouraged as to what may be done in guiding patients in the personal care of their mouths. There may be occasional discouragements, but such instances, by perseverance, can be almost always transformed into the strongest arguments of the truth as preached. Lately I have become more firmly convinced of the value of the practice advocated. Make a special point that the gingival tissues covering the roots of the teeth to the entire limits of the alveolar processes, both internally and externally to the alveolar arches, rather than the teeth, must receive brush friction—the idea being that if this portion of the mouth be brushed, then the teeth themselves will receive their ample share.—J. W. WASSALL, *Dental Review.*

Where Porcelain is Again Useful.—I had presented for repair a perfectly constructed continuous-gum denture, the only fracture being the broken cutting edges of two anterior teeth diagonally. As it appeared too trivial a defect to sanction the removal of the fractured teeth, and yet was an annoyance to the patient on account of roughness and irregularity, I decided upon the following method: I selected the colors of The S. S. White Co.'s inlay powders that mixed, matched the remaining portion, and after thoroughly cleansing the denture as in repair work, built up the fractured teeth, and baked in the Hammond furnace until they compared to the original contour. It has proved a gratifying success in appearance and durability, and saved me from much work and risk which would have been encountered in the old method of removal and replacement of teeth.—STEPHEN PALMER.

Definitions for "Sepsis," "Asepsis," "Antisepsis," "Disinfectant," "Germicide."—By the term *sepsis* we understand the existence of a condition in which bacterial infection with its sequela, fermentation or putrefaction, is brought about by the presence of germs or their products, while *asepsis* implies entire freedom from such infection, viz, a sterile condition. If a primary septic condition is changed by some method or means which inhibits the growth of putrefactive organisms, *antisepsis* is secured. Consequently, antiseptics are chemical agents which merely inhibit the action of bacteria, while *germicides* destroy the vitality of the infective organisms. On the other hand, *disinfectants* chemically change the poisonous products of

the bacteria to some inert compound without necessarily killing the organisms. Thus it will be seen that an antiseptic is not necessarily a germicide or a disinfectant; thus glycerin will inhibit the growth of certain bacteria, and is therefore antiseptic, but it has very little or no power to destroy the bacteria themselves or their spores, and consequently possesses no germicidal or disinfective properties.—HERMANN PRINZ, *Dental Review*.

The "Ion" Theory.—When acids, salts, or bases are dissolved in a liquid, usually water, the molecules of these compounds break up into ions. The resulting solution possesses the property of conducting an electric current, and according to Faraday is called an electrolyte. When such a current passes through the solution the latter undergoes certain changes which are generically termed electrolysis. If, on the other hand, a liquid has not the power of dissociating molecules into ions, it cannot conduct an electric current. Now, according to Arrhenius the conductivity of an electrolyte is proportional, depending upon (1) the number of ions, (2) the relative electric charge of these ions, and (3) the speed of the ions. Further, the resulting ions depend, within limits, on the degree of dilution of the solution; a certain definite dilution dissociates completely all molecules, and further dilution merely separates the ions farther from each other. For example, if sodium sulfate (Na_2SO_4) be dissolved in water, two positive Na ions (kations), and one negative SO_4 ion (anion) are the results. Water has, so far as known, the greatest dissociating power, with the possible exception of hydrogen dioxide; however, formic acid, methyl alcohol, ethyl alcohol, ammonia, and others are known to possess this peculiarity to a greater or less degree. The organic compounds are much less dissociated than inorganic salts, and their ions are more complex and at present are very little understood.—HERMANN PRINZ, *Dental Review*.

A Point in the History of Amalgam.—

It was not until Dr. Elisha Townsend, a Philadelphia dentist of high standing, openly advocated it, that amalgam came at all into general use. His skill dispelled all imputations of his inability to work in gold. The material he used, generally known as Townsend's alloy, was really introduced to the profession by Dr. W. M. Hunter of Cincinnati; and one of Dr. Townsend's last acts was to emphasize the statement, which he had made repeatedly, that the formula was Hunter's and not his. After Townsend's death the

use of amalgam seemed to be falling back into its old position—due perhaps to some opinions that Townsend published just before he died, when a small body of dentists and metallurgists—led by the late J. Foster Flagg, and styling themselves the "New Departure Corps"—by sound reasoning, followed up by undeniable demonstration, finally won for plastic materials the recognition they now have. Our alloys are very much better than those used by Taveau. The questions of color, shrinkage, expansion, flow, etc., have been fully investigated by Drs. Flagg, Black, and others, so that we have an alloy in which these drawbacks are reduced to a minimum. With careful preparation of the cavity and insertion of the filling material, and no less careful finishing than is bestowed on a gold filling, amalgam will make a plug for an ordinary cavity quite as durable as gold, while in very large cavities it is far superior. Its color unfortunately limits it to the posterior teeth.—H. C. FITZHARDINGE, *Penn Dental Journal*.

Combination of Non-Cohesive with Cohesive Gold.—

It is confidently believed that there are very many cavities which can readily be filled by employing a combination of non-cohesive gold with cohesive, which with cohesive alone would prove too taxing. Non-cohesive gold may be used in larger masses than cohesive, and with the assurance that these masses may be carried to place so as to perfectly fit the cavity walls and to lie in the most intimate relation one to the other. The fact that the layers of foil in a non-cohesive cylinder will slide across each other under pressure without cohering renders it possible to force the gold into the most inaccessible angles and corners of the cavity, and also to compress the various layers into the closest possible coaptation with each other. The force of the plugger impact is conveyed through a larger mass of gold and to a greater distance because it is not interfered with by cohesion of the particles. It is for this reason that an operation may be very materially shortened by employing non-cohesive gold in certain parts of the filling where adaptation is of the greatest importance, and where there is no attrition in the process of mastication. The gingival third or even one-half of some of these fillings may be made of non-cohesive gold with the best possible results, in very much less time and with less exertion than if cohesive gold were used throughout; the fact that this method is effective is amply demonstrated by the existence of many such fillings that have been doing good service and

saving the teeth for years. It is not claimed that a filling thus made is of equal hardness throughout to one made exclusively of cohesive gold. If for any reason it ever becomes necessary to drill into such a filling, it will be found that after the drill has laboriously forced its way through the cohesive gold it will at once sink into the non-cohesive gold and bur it out without difficulty. This naturally gives the impression of softness, and in the minds of some operators leads to a doubt as to the stability of a filling so constructed.—C. N. JOHNSON.

The Diatoric Tooth in Bridge Work.—

The teeth are carefully selected to fit the case with as little grinding as possible. The form in which they are made, with a long curve on the inner surface, permits the cervico-lingual surface to fit the curve of the average ridge with little or no grinding, but if the grinding be necessary it should be done on the base of the tooth rather than on the morsal surface. A piece of pure gold plate about No. 32 gage is cut to a size sufficient to cover the base of the tooth and project over the sides about one-eighth of an inch. This is laid on the base of the tooth and burnished to fit as nearly as possible, the edges being turned up all around to form a cup-like shape. A metal ring, which will fit in a crown swager, is filled with hot modeling composition, and the morsal surface of the diatoric tooth is pressed into it to a sufficient depth to hold it firmly, and the whole plunged into cold water, to harden the composition. With the piece of gold in position on the imbedded tooth, they are placed in the swager and covered with corn meal or some equally yielding substance, and swaged down, until the gold cup fits the tooth accurately. Upon removal, the gold is trimmed to the desired height around the edges, always allowing it to extend well up to the little holes on the approximal sides of the tooth, and then with a ball burnisher it is burnished into the central depression in the base of the tooth. The gold will be perforated when burnishing it into this hole, but the burnishing should be continued until the metal accurately fits the margins. It is then filled about one-third full with gold or platinum foil. The gold cup is then removed from the tooth and the balance of the hole is filled with 20-k. solder, until it is flush. This gives you a gold cup and pin, which closely fit the diatoric tooth, holding it so firmly that it would almost keep its place without cementing. With the teeth in the cups, but not fastened, they are assembled on the cast and waxed to each other and

to the piers, on the lingual side. The assembled piece is then carefully placed in the mouth and any error in occlusion is corrected by allowing the patient to bite the teeth to place. The diatoric teeth are then removed from the cups, and the piers and cups are taken from the mouth in an impression of terra plastica or some suitable investing material. This gives you the pieces invested and ready to solder at the approximal surfaces. For additional strength, a piece of gold plate is laid across the lingual aspect from pier to pier, and the whole overflowed with solder. The polishing should be done with the porcelain teeth in position to prevent possible injury to the fine edges of the gold cups, but they should not be fastened permanently in the cups until everything is completed and ready for the mouth, thus avoiding dirty joints. The teeth may be permanently fastened in the cups, with zinc oxyphosphate, gutta-percha, or by the use of powdered sulfur, after the manner of attaching English tube teeth to gold plates. In the case of the fracture of one of these dummies, the repair can be quickly and easily done in the mouth, as the diatoric teeth are readily duplicated, but the danger of fracture is very remote, as the porcelain is at no time subjected to heat, and you have the full thickness of the tooth incased in gold to withstand the force of mastication. This method gives you a maximum degree of strength, a minimum display of gold, and an occlusion which is well-nigh perfect.—Dr. SANGER, *Items of Interest*.

Experiments on Disinfection.—The London County Council has issued a report containing the results of experiments conducted for them by Drs. Klein, Houston, and Gordon in connection with the subject of disinfection. Both gaseous and liquid disinfectants were tested, the actual process of disinfection being, in the former case, supervised by Dr. Newman. Unvarnished or unpainted wood, cloth, linen, and wall-paper were the materials selected for treatment. The organisms experimented with were: Spores of *B. anthracis*, human *B. tuberculosis*, and fresh cultures of *B. diphtheriæ*, *B. pyocyaneus*, *B. cholerae Asiaticæ*, *staphylococcus pyogenes aureus*, *B. typhosus*. In the case of *B. tuberculosis*, human sputum rich in the bacilli was applied directly to the articles to be tested; in the other cases the organisms were first distributed in broth, milk, or melted gelatin, and the mixture then freely applied. After exposure to the action of the disinfectant the material was examined in the laboratory. It was first immersed in sterile broth or water to remove traces

of disinfectant, and then cultivated. When growths ensued they were identified microscopically by sub-culture and by animal experiment. In the case of sputum the material was scraped off, distributed in salt solution, and injected into guinea-pigs. The results were as follows:

Formalin Vapor. Thirty formalin tablets, each weighing 0.034 oz., were burnt in a room of 1344 feet cubic capacity containing the infected articles, with window, fireplace, and door sealed. The time of exposure was five hours. It was found that all the microbes exposed on linen were killed, and with the exception of anthrax spores, those on paper. In only three cases did the organisms on the wood and cloth survive. One of these was in the first experiment with typhoid; but as in two later experiments typhoid was completely devitalized, the investigators think the first result was due to some accident. Anthrax spores and tuberculous sputum provided the second and third cases of incomplete disinfection.

Sulfur dioxid. Three and a half pounds of sulfur were burnt in a room with a capacity of 1075 cubic feet; the articles were exposed to the gas for twenty-four hours. The sulfur dioxid failed to disinfect any of the samples of sputum, even those spread on linen and paper; it also failed to kill the anthrax spores on wood and cloth. All the other organisms it destroyed.

Carbolic acid. Infected material was soaked

in five per cent. aqueous solution for twenty-four hours. In every experiment the anthrax spores survived; all other bacteria were killed.

Condy's fluid. Twenty-four hours' soaking in a solution containing a teaspoonful to the pint proved quite useless, and a solution five times that strength gave only slightly better results. The investigators suggest that the organic matter submitted with the microbes may have interfered with the disinfecting power of the fluid.

Corrosive sublimate. A solution of 1:1000 destroyed all organisms in twenty-four hours.

Bleaching powder. In a one per cent. solution this substance gave very poor results with one hour's exposure; somewhat better with twenty-four hours', but on the whole it was only efficacious with the less resistant organisms. Somewhat exceptionally, however, it was more successful with anthrax spores than was carbolic acid, as it destroyed them on paper even in one hour.

Special points brought out by the report are the difficulty of disinfecting cloth and unvarnished wood, and the unsatisfactory action of Condy's fluid and bleaching powder. For tuberculous sputum, phenol and corrosive sublimate were the only thoroughly efficacious disinfectants; formalin vapors did not destroy bacilli on wood or cloth, and sulfur dioxid proved altogether ineffective. Both gases, however, were successful with *B. diphtheriæ* and *staphylococcus pyogenes aureus*.—*Dominion Dental Journal*.

DECISIONS UNDER DENTAL LAW.

THE PRACTICE OF DENTISTRY IN PENNSYLVANIA BY COMPANIES OR CORPORATIONS DECLARED ILLEGAL.

IN an opinion handed down by Judge Weiss of Dauphin County on May 26, 1904, in a proceeding by quo warranto against the Alba Dentists Company, it was decided that a corporation has no right to conduct the practice of dentistry in Pennsylvania, and that in so doing it was acting in violation of law, and judgment of ouster was entered excluding it from exercising its franchise in Pennsylvania.

The writ of quo warranto was issued September 14, 1903, on the suggestion of Hon. Hampton L. Carson, attorney general, acting upon the affidavit of the chairman of the Committee for the Enforcement of Law of the

Pennsylvania State Dental Society, supported by additional affidavits showing that the Alba Dentists Company was incorporated in New Jersey for the apparent purpose of manufacturing and dealing in dental instruments and supplies, but that in fact it was actually conducting the practice of dentistry in Philadelphia, where it had numerous offices managed by operators in dentistry, many of whom were not graduated or registered, and some merely students employed upon salary.

Upon the writ of quo warranto being issued containing the charges above mentioned, the Alba Dentists Company filed an answer by

which it was contended that a corporation was entitled to conduct the practice of dentistry by the employment of operators who were registered graduates in dentistry, and further alleging that such operators were then being employed.

A demurrer was filed to this answer, and on November 16, 1903, a typewritten brief of argument prepared by Charles L. Smyth, Esq., representing the Pennsylvania State Dental Society, was filed, which was followed on December 30, 1903, by an oral argument.

The opinion of Judge Weiss is as follows:

Opinion.

COMMONWEALTH OF PENNSYLVANIA

Ex relatione

HAMPTON L. CARSON, ATTORNEY GENERAL,
vs.

ALBA DENTISTS COMPANY.

In the Court of Common Pleas of Dauphin County. No. 187 Commonwealth Docket, 1903.

Quo warranto.

BY THE COURT:

The Attorney General caused a suggestion to be filed in this Court on the 26th day of August, 1903, in which he set forth that the Alba Dentists Company was incorporated March 16, 1901, under the laws of the state of New Jersey, and after setting forth at length the objects for which the corporation was formed, complained that it is "conducting the practice of dentistry in this Commonwealth without any authority, and is conducting said practice by the employment, for hire, of students who have not graduated in dentistry, but who are in the employment of the said corporation and working for the said corporation for wages at the several dental offices of the said corporation, and who are regularly engaged in operating continuously in dentistry upon all such persons as patronize the offices of the said corporation, and the moneys thereby derived are for the use and benefit of the said corporation; . . . that the practice of dentistry is not one of the objects authorized by the charter of the said corporation, and that the practice of dentistry by a corporation is a violation of the laws of this Commonwealth, and that the employment of students as operating dentists is contrary to law and against public policy, and detrimental to the welfare of the citizens of this Commonwealth.

Thereupon a writ was authorized to be issued the same day, the service of which the

defendant moved, September 8, 1903, to set aside because the writ was not served ten days before the return day as required by law.

An alias writ issued September 14, 1903; an appearance was entered for defendant October 1, 1903, and an answer filed the same day. It denies the jurisdiction of the Court to proceed to the cause for the matters set forth on the writ of quo warranto; that it is conducting the practice of dentistry by the employment for hire of students not graduated in dentistry, and that such students are employed for wages at its several dental offices as complained by the suggestion; that it practices dentistry in violation of the laws of this Commonwealth, and that it employs students as operating dentists; and avers that its several dental offices are under the control of graduated dentists, regularly registered and licensed to practice dentistry in the Commonwealth.

The Commonwealth demurs to the answer of the defendant company, and for cause of demurrer says:

1. That a corporation is not a person within the meaning and intent of the Act of July 9, 1897 (P. L. 206), the 13th section of which provides that "From and after the first day of October 1897 it shall not be lawful for any person in the State of Pennsylvania to enter upon the practice of dentistry unless he or she has complied with the provisions of this Act, and has exhibited to the prothonotary of the Court of Common Pleas of the county in which he or she desires to practice dentistry a license duly granted to him or her as hereinbefore provided."

2. That the answer does not disclose a compliance by the respondent with any of the provisions of the Act of July 9, 1897.

3. That it is not made to appear that the respondent has any power or authority conferred upon it by its charter to conduct the practice of dentistry, and among other things that this Court has jurisdiction in quo warranto proceedings to determine the right of a foreign corporation to conduct business in this state.

The Act of 1897 also requires that the Board of Dental Examiners examine, and make report of the examination of applicants for license to practice dentistry, to the Dental Council, who are authorized to issue such license, and which must be exhibited to the prothonotary of the proper county, who on the payment of a small fee registers the applicant; failure to observe which constitutes a misdemeanor on the part of such intended practitioner.

It is not asserted that there was any compliance by the defendant with the provisions of the Act of July 9, 1897. In fact the company could not as a corporate body comply literally with the provisions relating to the examinations; nor is it claimed that the observance of the requisites of the Act of April 22, 1874 (P. L. 108) did more than authorize it to do business in this state.

That Act does not attempt to confer upon any foreign corporation the right to exercise any particular franchise in this state. Its object is, as expressed in its title, "to prohibit foreign corporations from doing business in Pennsylvania without having known places of business and authorized agents."

Among the charter powers are the purchase, lease, or acquisition of lands and buildings and their adaptation to dental parlors or offices and their equipment for the uses of dentistry; to conduct either as principals or agents any other business of a like nature and deal in any article belonging to any such business or trade; to manufacture or acquire drugs, compounds, patent medicines, etc., designated for use in the arts and sciences; to deal in goods, wares, and merchandise and property of every class and description; to purchase, hold, sell, convey, or mortgage real estate in any part of the world; to manufacture apparatus, appliances, and furniture of every description; to acquire, operate, and introduce and sell trade-marks, patents and improvements, and grant licenses or turn to account such trade-marks, patents, processes, or any such property; to engage in any other lawful business, except such pursuits as require the exercise of the right of eminent domain; to purchase or dispose of stocks, bonds or other obligations in payment of property acquired for any object in and about its business, to guarantee any dividends, bonds or contracts, and for furthering any of its objects to do all things and exercise all power which a copartnership or natural person could do and which now are or hereafter may be authorized by law.

There is a notable silence among the various pursuits enumerated in the defendant's charter respecting that pursuit which it is and advertises to be engaged in—the practice of dentistry. Those objects are detailed with minute particularity, and it would have been an easy task to embody in the charter in express words the right to practice dentistry, and not to leave to inference what was mainly, if not wholly, the actual object.

The right to practice dentistry could not be declared from the language "to engage in any other lawful business of any kind or

character," etc., and there appears nothing in the suggestion filed by the Attorney General in which the objects, or some of them, are enumerated which would sanction the finding of such right. The fact is accordingly found that the Alba Dentists Company, defendant, is not authorized or empowered by its charter to conduct or engage in the practice or business of dentistry.

What a corporation does it must do through agents, it is true, and it is also true as contended by the respondent that a corporation cannot practice dentistry any more than a railroad corporation "runs an engine." A railroad corporation "runs an engine" by an agent or employee, but it must have the right to construct and build a railroad by its act of incorporation, and then it has the right to run an engine.

The defendant must have the right to engage in dentistry before it can claim to carry on the practice by an agent. Otherwise the agent, however competent and qualified, would be the principal and the company simply the beneficiary.

The respondent's averment "that all acts, doings, and business performed by it are within its corporate power as conferred upon it by its charter and the authority granted by the Commonwealth of Pennsylvania" is not conclusive against what inspection of the charter discloses.

If it is a fact that the several dental offices are manned by graduated and regularly registered and licensed dentists, it proves nothing. The Commonwealth's claim is leveled against the practice of dentistry in the state by the defendant company by reason of the absence of corporate authority or power to so conduct the business.

That it is so engaged in practice is not only not denied, but sought to be justified. The company's literature speaks of its employing skilled dentists, fixes the price charged by it for full sets of teeth, paying large salaries, furnishes "latest scientific dentistry," uses patent appliances for restoring teeth, and is "unrivaled in certain lines of the business."

If the draughtsman of the articles of association had made a studied effort to approach expressing what the incorporators actually intended, and yet avoided expressing that intention, he could not well have been more successful. As it was he steered between the dangerous rock and whirlpool and imperiled his craft.

The company cannot be examined as to fitness, and therefore it cannot exhibit a license from the Dental Council to the prothonotary of the court of the county in which it desires

to practice dentistry, and be registered. But an examination by the applicant, and the presentation of a license to practice, and consequent registry, are statutory prerequisites to engaging in practice, and to say that a corporate body cannot be examined in respect of qualifications to practice dentistry is only saying that the Act of July 9, 1897, necessarily contemplated natural persons only. If it cannot observe the law of the state as a precedent requisite, it cannot exercise the franchise. The impossibility of compliance by the company with the law of this state works its exclusion from its limits to engage in the business authorized by the law.

The conclusion to which this brings us is

that the Alba Dentists Company is not empowered by its charter provisions to practice dentistry within the territorial limits of the state; and that it is carrying on the art, business, or practice of dentistry in this state without warrant of law. No question to the form of the action is raised, and judgment on the demurrer is for the Commonwealth with costs, and that the defendant be ousted and altogether excluded from exercising the right or franchise of practicing dentistry within the Commonwealth of Pennsylvania.

JOHN H. WEISS, P. J., May 26, 1904.

[*Harrisburg, Pa.*, June 2, 1904.—The above is a true copy of the opinion of the Court rendered in the above case.]

OBITUARY.

DR. CYRUS TRUMAN MEAKER.

DIED, at his home in Carbondale, Pa., May 9, 1904, from pneumonia, CYRUS TRUMAN MEAKER, D.D.S.

Cyrus Truman Meaker was born in Hawleyton, Broome County, N. Y., January 3, 1856. He was graduated in the second class of the dental department of the University of Pennsylvania in 1880, and after practicing in Plymouth for five years he further equipped himself by a post-graduate course at Dartmouth College, graduating in medicine in 1886. He located in Carbondale immediately after his graduation, remaining there until the time of his death, exerting a forceful influence in his profession, in church work, and in civic and fraternal affairs.

Professionally, Dr. Meaker was always conspicuous in advanced movements. He was a past president of the Susquehanna Dental Association; a member of the State Dental Society, the Carbondale Medical Society, the Alumni of the University of Pennsylvania, and the Alumni of Dartmouth College. He held membership in several fraternal organizations. Dr. Meaker was a zealous member of the local Presbyterian church and a member of its board of trustees. He was a lover of nature, and frequently made excursions during the summer season. It was while on a trout-fishing trip through the Pocono mountain region that he contracted the cold that ended in his death.

Dr. Meaker was married to Miss Frances Raynor in 1889. Besides his wife, two children survive him—Samuel Raynor Meaker and Rebecca Ensign Meaker; also two sisters, Miss Ellen Meaker and Mrs. N. M. Hurlburt of Binghamton, N. Y.; and one brother, Arthur E. Meaker, professor of mathematics at Lehigh University.

DR. AGUSTIN E. MASCORT.

DIED, at Havana, Cuba, April 9, 1904, from cerebral hemorrhage, DR. AGUSTIN E. MASCORT.

Dr. Mascort was born in Trinidad, Cuba, May 14, 1861. He came to the United States in 1879 and immediately afterward matriculated in the department of dentistry of the University of Pennsylvania, from which institution he was graduated in 1881.

From the time of his entrance into the ranks of dentistry up to that of his death Dr. Mascort worked indefatigably for the advancement of his chosen profession, and his numerous contributions to dental literature published in the leading dental journals throughout the world remain as an indelible monument to his ever-active career and to his love for scientific research. In 1893 he conceived the idea of filling the roots of teeth with salol. The original paper on the subject was published in the *DENTAL COSMOS* for May 1894, and was reprinted in various

languages in a number of the leading professional periodicals.

He returned to the United States in 1896 as the special envoy of the Laboratory of Histology and Bacteriology of Havana to report on the organization of laboratories and plants for the manufacture of anti-diphtheritic and other sera.

He held membership in numerous dental and scientific organizations, among which may be mentioned the National Dental Association, the Dental Alumni Society of the University of Pennsylvania, Société de l'École Dentaire de Paris, Société Odontologique de Paris, and Sociedad de Higiene de la Habana. He took an active part in the international congresses of 1893 and 1900—in the Committee on Biology and Bacteriology of the former and in Sections IV and VIII of the latter.

Dr. Mascort's untimely death is keenly felt by a large host of professional and social friends who recognized and appreciated his sterling qualities and professional enthusiasm. He is survived by a brother.

DR. FREDERIC MILLER ROBINSON.

DIED, at Boston, Mass., August 30, 1903, from typhoid fever, FREDERIC MILLER ROBINSON, D.D.S.

Dr. Robinson was born in St. John, N. B., April 13, 1848. He began the study of dentistry under Dr. C. K. Fisk of St. John, with whom he remained associated as student and assistant for over four years. In 1872, after a systematic course of dental training, he received from the Harvard University Dental School the degree of D.M.D.

He took an active interest in society work, having been identified with the American Academy of Dental Science, the Boston Society of Dental Improvement, and the Massachusetts Dental Society, serving the latter organization as librarian for over three years.

Dr. Robinson was a man of genial temperament, highly esteemed by his *confrères* and by everyone whose fortune it was to meet him. His passing away has produced in dental ranks a vacancy hard to fill, and in the hearts of his friends a wound which time alone may partially heal.

"IN MEMORIAM" RESOLUTIONS.

Dr. I. P. Wilson.

THE Iowa State Dental Society, at its annual meeting recently held at Des Moines, passed the following resolutions of regret upon the death of Dr. I. P. Wilson:

Whereas, Since the last meeting of this society, death removed from us on the 9th day of March, 1904, one of our most honored and esteemed members, Dr. I. P. Wilson of Burlington, we, as members of this society wish to give this expression as to his worth and character, and to the esteem in which he was held by this society and the profession of the state.

Dr. Wilson was an Iowa dentist, having come to the state from Ohio when about fifteen years of age, studied dentistry with Dr. Tullus of Iowa City, and later graduated from the Missouri Dental College. He spent the whole of his professional life in Iowa, and the greater part of it in Burlington. For forty-one years he was a member of this society, being prominently connected with its early history.

Dr. Wilson was devoted to his profession, never being satisfied with present attainments but constantly pressing forward, keeping abreast with the advance made by the profession. He always regarded this society as indispensable to his advancement. As an instructor in the dental department of the State University of Iowa, and later in the Keokuk Dental College, he endeared himself to the hearts of the students. He was pre-eminently the friend of the young men of the profession, and his influence was that of an honest, upright, professional Christian gentleman. Therefore,

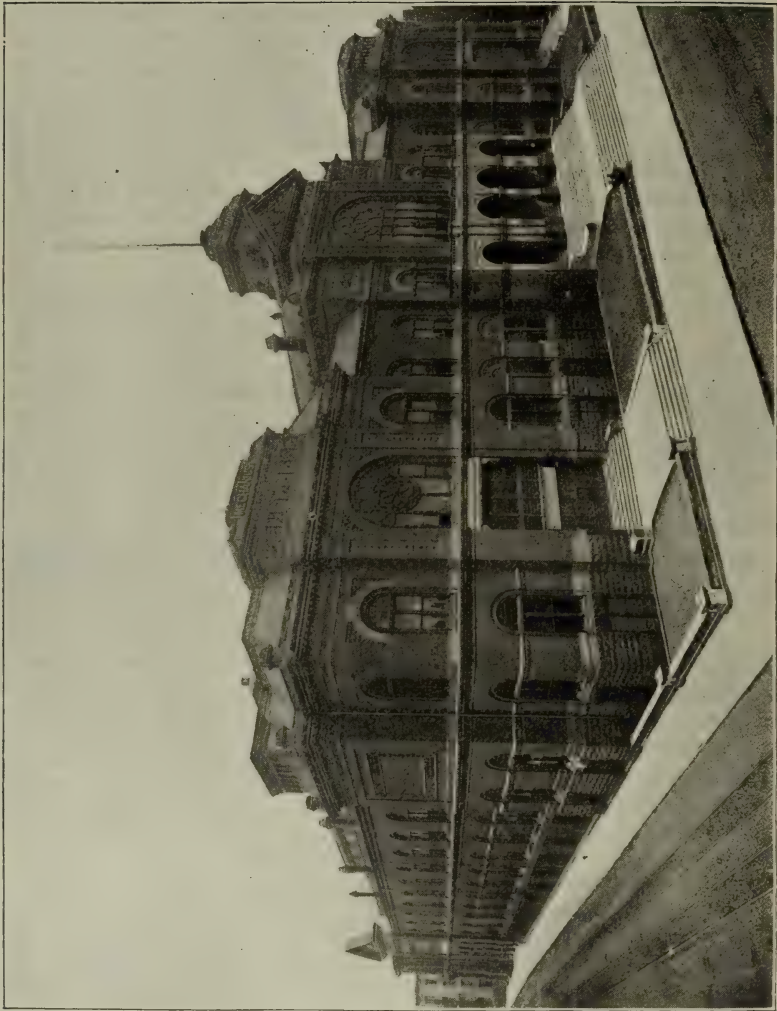
RESOLVED, That this society hereby testifies to the loss we experience in the death of Dr. Wilson, and we extend our sincere sympathy to Mrs. Wilson and the family in their bereavement; and further, that these resolutions be spread upon the records of this society and that a copy be sent to Mrs. Wilson and the family and also to the dental journals for publication.

J. B. MONFORT,

A. W. DANA,

ANNA H. JOY,

Committee.



The Coliseum Building, St. Louis,
WHERE THE FOURTH INTERNATIONAL DENTAL CONGRESS WILL BE HELD.

Fourth International Dental Congress.

GENERAL INFORMATION.

THE Fourth International Dental Congress to be held in St. Louis, August 29th to September 3d, inclusive, 1904, will convene in the Coliseum, a building most favorably adapted to the holding of such a gathering and possessing accommodations so ample that all of the features of the Congress will be held under one roof and without interference one with another. This great structure occupies two blocks between Olive and St. Charles, and Thirteenth and Fourteenth sts.; it covers an area of nearly four acres, with a floor space for exposition purposes of 300,000 square feet.

The Coliseum is one of the largest and most commodious convention halls ever built, and is practically fireproof. It contains a large theater capable of seating 2500 people, which will be used for the general sessions of the Congress, and ten additional meeting-rooms, furnishing ample accommodations for the simultaneous meeting of the ten sectional divisions of the Congress; a large hall for exhibits, covering 9000 square feet of floor space, practically all of which has been taken by intending exhibitors; and a well-lighted gallery for clinics, capable of accommodating the one hundred chairs which have been provided for that purpose. In addition to the foregoing, numerous committee-rooms and telegraph, telephone, and postal facilities will be provided in the building, and it is expected also that a well-ordered café will be in operation during the time of the Congress.

In connection with the building, and under the same roof, is the Coliseum

proper, where 19,000 persons may be comfortably seated, exclusive of the stage, and it is anticipated that this audience-room will be used for one of the social features of the Congress, constituting an entertainment unique of its kind.

Besides the advantages of its ample accommodations for the Dental Congress, the Coliseum building has the advantage of being located in the heart of the business section of St. Louis, and at considerable distance from the Exposition, so that the meetings will be less disturbed by the diverting attractions of the great Exposition than if the Congress were held within the Exposition grounds.

Accommodations.

The Local Committee of Arrangements has selected the Hotel Jefferson as the general headquarters of the Dental Congress. This is one of the most fashionable and complete hotels in the United States, and is located on Twelfth st., one block from the Coliseum. In addition to the Hotel Jefferson as headquarters, the hotel accommodations of St. Louis will be sufficient to meet all requirements. The Information Bureau of the Exposition has a list of ninety-seven well-established hotels in St. Louis with a capacity of 41,000 guests at prices ranging from fifty cents a day upward on the European plan, and from one dollar a day upward on the American plan. These established hotels have been supplemented during the year 1903 by thirty-five new permanent hotels, increasing the permanent hotel capacity to

67,000 guests, at prices ranging from one dollar a day upward. The Exposition management holds the signed agreement of the leading hotels that "rates shall not be increased during the World's Fair period." Prices are now lower in St. Louis than in any other city for similar hotel accommodations and service.

The Exposition Information Bureau's list of 132 permanent hotels includes only those of the better class. There are now 173 hotels, large and small, in operation in the city, and the new hotel enterprises being inaugurated justify the belief that the number will reach 250.

Besides hotels with accommodations for more than 200,000 guests, the Exposition Information Bureau has a list of boarding-houses and rooming-houses of a respectable character on the street-car lines with lodgings for 65,000 guests, and a list of private houses that will let rooms for 20,000 persons. All over the city permanent houses and rooming-houses are available to those who prefer rooms away from the crowds, with meals at the restaurants. There are 485 restaurants in St. Louis that have a national reputation for good fare, good service, cleanliness, and moderate prices; twenty of these 485 restaurants can take care of 40,000 patrons.

Cost of Living during the Fourth International Dental Congress.

The Local Committee and Bureau of Information, wishing to dispel from the minds of the profession, and of all persons laboring under such misconception, the idea that the rates of St. Louis hotels are extortionate, have issued the following bulletin:

We have investigated the conditions and rates of the leading hotels of St. Louis, and notwithstanding the fact that this city is entertaining a World's Fair, the hotel rates are no higher than in other cities.

We append a number of the leading hotels and rates of the same, and call your attention to the fact that it is not requisite to put up at any of the hotels mentioned, as there are

many hotels and boarding-houses in the city where rooms can be secured for from 50 cents to \$2 per day. (The exact date should be stated in securing rooms.)

Southern Hotel. The American-plan rate is \$5 a day for a room without bath, and \$6 a day for a room with bath. The rate is \$10 a day if two persons occupy the room.

Planters' Hotel. Room without bath occupied by one person, \$3 to \$4 a day; same for two persons, \$6 to \$7 a day. Room with bath, for one person, \$4 to \$5 a day; for two persons, \$7 to \$8 a day.

Jefferson Hotel. Room without bath, for one person, \$4 a day; two persons, \$6 a day. Room with bath, for one person, \$5 a day and up; two or more persons, \$7 a day and up.

St. Nicholas Hotel. Room without bath, for one person, \$2.50 to \$3.50 a day; for two persons, \$4 to \$5 a day. Room with bath, for one person, \$3 to \$5 a day; for two persons, \$5 to \$7 a day.

Lindell Hotel. Room without bath, for one person, \$2 a day; for two persons, \$3 a day. Room with bath, for one person, \$3 a day; for two persons, \$4 a day.

Washington Hotel. Room without bath, for one, two, or three persons, \$5 to \$7 a day; room with bath for one, two, or three persons, \$8 a day.

Laclede Hotel. Room without bath, for one person, \$1.50 to \$2 a day; for two persons, \$3 a day; room with bath, for one person, \$3 a day; for two persons, \$5 a day.

Terminal Hotel. Room without bath, for one person, \$2 to \$3 a day; for two persons, \$4 to \$5 a day. Room with bath, for one person, \$5 a day; for two persons, \$7 a day.

Mosier Hotel. \$1 to \$3 per day, European plan, with "Silver Moon" Restaurant attached at very reasonable rates. Located at Ninth and Pine sts.

Hotel Rozier. Opposite Exposition Building, Olive and Thirteenth sts. Rooms without bath, \$1 to \$2 a day.

Mammoth Hotel Company. S. E. cor. Olive and Twelfth sts. Can accommodate 2500 guests a day at rates from 50 cents to \$1.50 a day.

The Inside Inn. With a capacity for 5500 people, it is within the Exposition grounds, erected under a contract with the Exposition management, stipulating its rates. This Hotel offers 500 rooms at \$1 a day, 500 at \$1.50 a day, 500 at \$2 a day, and the remainder, which are larger with baths, at higher rates.

The Napoleon Bonaparte, The Forest City, The Fraternal, The University, The Kenilworth, The American, The Epworth, The Grand View, The States, The Oakland, The Iowa, The Guaranty, The West Park, The Christian Endeavor, The Visitors, and others, with a capacity for from 500 to 5000 guests, are within easy walking distance of the World's Fair gates. In fact, we have hotels, boarding-houses, apartment houses, and room-

ing-houses all over the city, of respectable character and on the street car lines.

An impression prevails that there may be lack of accommodation at reasonable prices. Not only will there be *sufficient room* for all who come, but *the rates will be reasonable*. We appeal to the profession of the country to give information respecting the accommodations in a spirit of fairness and justice to St. Louis based upon the above facts. St. Louis is prepared to care for and welcome all comers, and to show them the grandest Universal Exposition of the world's resources and products in the history of man.

The Fourth International Dental Congress is now an assured success. Many foreign nations have signified their intention to take part in this Congress; the islands of the Pacific Ocean will be well represented. Their assembling in the center of this great Republic should stimulate every American dentist to action, and each individual of this great profession should feel under obligations to help to push the Congress to a successful issue. We have our professional record to maintain and to act the part of host. As a consequence we should endeavor to sustain the reputation of American hospitality. Here is the birthplace of the dental college, most of the inventors, the mechanical geniuses, and the men who have brought about the wonderful advances in our great profession. We trust the profession of America will take hold with their accustomed vigor, will let nothing be undone that will be for the good of the profession, and carry all things with a most liberal spirit to a surprising conclusion.

A list of hotels, boarding-houses, rooming-houses and private homes with their rates appended will be furnished by the committee to all who ask. Any other information will be freely given by corresponding with any of the following committee:

D. O. M. LeCron, *Ch'man*,
Mo. Trust Bldg.
MAX FENDLER, *Sec'y*,
Mo. Trust Bldg.
H. F. D'OENCH,
GEO. H. GIBSON,
S. H. VOYLES,
ORME H. MANHARD,
JOSEPH G. PFAFF,
G. S. KITCHEN.

St. Louis and Its Surroundings.

The climate of St. Louis is temperate in summer and most delightful in the spring and autumn. The weather which visitors to the Louisiana Purchase Exposition may expect is shown by the "normals" at St. Louis, taken from the records of the United States Weather

Bureau. These "normals" are the averages of the temperatures at St. Louis during the thirty-three years that the Weather Bureau has had a station in St. Louis. The "normals" are as follows: May, 66.1; June, 75.4; July, 79.4; August, 77.6; September, 70.2; October, 58.7; November, 44.3. How closely the actual temperature for any one year follows the normal is well shown by the mean temperature for the month taken by the Weather Bureau at St. Louis during the past year. These temperatures are: May, 71.8; June, 74.2; July, 80.3; August, 76.4; September, 66.4; October, 62.2; November, 63.3. The weather at St. Louis during October and November is particularly pleasant. It is the "Indian summer" of the middle states.

St. Louis is the most central and most accessible of the four large cities of the United States. Twenty-seven railways enter it, besides passenger steamers on the Mississippi reaching it from the north and south.

World's Fair cheap rates on railways and steamboats will be offered during the whole Exposition season as follows: Season tickets for eighty per cent. of double one fare, good to return until December 15th. For sixty days, one and one-third fare, not good to return after December 15th. For ten days, one fare plus two dollars, from points within 250 miles of St. Louis. For fifteen days, one fare plus two dollars, from points over 250 miles from St. Louis.

St. Louis is the fourth city of the United States in point of population, having 750,000 people. It presents peculiar attractions for the student of nature, science, history, etc. There are twenty-four public parks, containing over 2100 acres of well-improved property. The World's Fair grounds lie five miles from the Mississippi river on the eastern border of the state, and are reached quickly and comfortably by steam railways and electric lines. Visitors reach the city through one of the largest rail-

way stations in the world; thirty-two tracks enter the station side by side. Most of the hotels, except those in the World's Fair grounds, are within ten minutes' ride of the station, which is in the heart of the business district. Street cars reaching all of the hotels for a single five-cent fare pass the station, and the cab, carriage, and baggage system is excellent.

Nearly every member of the Fourth International Dental Congress will wish to see the World's Fair. The Local Committee of Arrangements has already planned a special "Congress day" at the Exposition, and ample opportunity will be provided for members to enjoy visiting this greatest of all expositions. Congressman Baltholdt in a recent speech made before the Congress of the United States, among other things, said: "All in all, the Universal Exposition of 1904 will be the sensational climax of the twentieth century, the grandest victory of peace and civilization, the greatest triumph human genius has yet achieved. To millions of its visitors it will be an academy of learning, an inspiration and an inexhaustible source of genuine delight, and the memories of the 'Ivory City' will live and bear fruit in the ages yet to come."

Visitors From Abroad.

Extensive preparation is being made for the hospitable care and entertainment of all members attending the Dental Congress. The General Committee of Reception, aided by the local committees, is making every effort to provide for the comfort and care of all visitors. Dr. D. O. M. LeCron, Missouri Trust Building, St. Louis, chairman of the Permanent Local Committee and Bureau of Information, will be pleased to answer all inquiries regarding the accommodations for those who desire to secure them in advance of the Congress. A subcommittee of the General Reception Committee has been appointed to meet and

give information and direction to those arriving from Europe and elsewhere at the principal ports of entry of the United States, and to arrange the details of transportation from the seaboard to St. Louis. These committeemen will answer inquiries as to hotels, railways, etc. The subcommittees of the General Reception Committee for the principal ports of entry are—

New York—Drs. W. C. Deane, 114 E. 60th st., and Gladstone Goode, 35 W. 46th st.

Philadelphia—Drs. J. D. Thomas, 1122 Walnut st., Joseph Head, 1500 Locust st., and Julio Endelman, S. E. cor. Twelfth and Chestnut sts.

San Francisco—Drs. H. P. Carlton, 62 Crocker Bldg.; P. D. Gaskill, Crocker Bldg.

New Orleans—Drs. J. J. Sarrazin, Godchaux Bldg.; R. H. Welch, Godchaux Bldg.

Baltimore—Drs. Cyrus M. Gingrich, 608 St. Paul st., W. G. Foster, 813 N. Eutaw st., and B. Holly Smith, 1007 Madison ave.

In other cities not ports of entry but which may be visited by members from abroad, the following committeemen will furnish all desired information:

Buffalo—Drs. F. E. Howard, 331 Franklin st., C. W. Stainton, 47 N. Pearl st., S. Eschelman, 421 Franklin st.

Chicago—Drs. T. L. Gilmer, 31 Washington st., J. W. Wassall, 92 State st., W. V-B. Ames, 34 Washington st.

St. Louis—Dr. Wm. Conrad, 3666 Olive st. (chairman Local Committee of Reception and Arrangements).

Washington—Drs. H. C. Thompson, 1113 Pennsylvania ave., N. W., W. E. Dieffenderfer, 616 Twelfth st., Wms. Donnally, 1118 Fourteenth st., N. W., and W. N. Cogan, "The Sherman."

The following itinerary has been arranged for delegates from abroad desiring to make the trip from New York to St. Louis and return:

Arriving at New York, an opportunity will be offered to all who may desire to visit that Metropolis of America. Leaving New York on the N. Y. Central and Hudson River Railway by special train, Pullman coaches and dining car—if there should be one hundred and fifty or more in the party, otherwise by regular trains—at about 9 A.M., making a daylight run along the beautiful Hudson

River, the Rhine of America, with the Palisades, West Point Military Academy (said by Prince Henry to be the finest military school in the world) and the famous Catskills, on the west bank; with Peekskill, Garrison, Rhinecliff, Poughkeepsie, and Hudson, thence to Albany, the capital of the Empire State, on the east—a distance of about one hundred and forty-four miles of probably the most enchanting and varied railway scenery to be found in the world. From Albany along the Mohawk river, through the Mohawk valley, one of the most picturesque and charming to be found in America, and replete with historic incidents; thence passing through Schenectady, Little Falls, Utica, Rome, and Syracuse, the great salt-manufacturing city of the world. From Syracuse the route skirts the Erie Canal (upon which the state of New York is now expending in the neighborhood of \$100,000,000 on enlargements), passing through Lyons, Newark, and Palmyra, prosperous cities of from fifteen to twenty thousand population each, thence to Rochester, one of the most important inland cities in the country, but interesting chiefly because of the Genesee Falls, the greatest in sheer descent of any on the American continent. From Rochester the route is through a section of the finest fruit belt of the Atlantic coast, passing Byron, Batavia, and Depew, arriving at Buffalo, the great electrical city of the world, about 7 P.M., where the night will be spent at the Hotel Iroquois, one of the great hotels of America. A side trip to be made the following day to the ever-beautiful Niagara Falls, twenty miles away, returning to Buffalo for dinner and lodging at the Hotel Iroquois. Leaving Buffalo at 8 A.M., via the Lake Shore and Michigan Southern Railway, famous for the fastest mail trains in the United States service and also as the route of the "Twentieth Century Limited," running between New York and Chicago in twenty hours; the Lake Shore Limited, in twenty-four hours, and the twenty-six hour trains between Chicago and Boston. It is also the railway which, on October 4, 1895, won the world's record for long-distance speed, making the phenomenal run of 510 $\frac{1}{10}$ miles in 470 minutes, or an average of over sixty-five miles per hour.

This route skirts Lake Erie, passing through Dunkirk, Ashtabula, Cleveland, Toledo, Fort Wayne, and Elkhart, arriving in Chicago at about 9 P.M., where the night and following day will be spent in seeing that most wonderful city. Leaving Chicago at 10 A.M. or 10 P.M., via the Chicago and Alton Railway, whose route for the first thirty miles is along the great Chicago Drainage Canal, a public work surpassing in magnitude and

difficulties the building of the Suez Canal; thence to Joliet and Springfield, the capital of Illinois and the last resting-place of Abraham Lincoln, to Alton, arriving at St. Louis either at 6 P.M. or 7 A.M., depending on whether the time of leaving Chicago is in the morning or evening. At St. Louis the Hotel Jefferson is selected as headquarters for the Congress, with rates from seven to ten dollars per day, with bath, either for one, two, or three in a room, European plan—and reservations should be made not later than August 1st. Those desiring less expensive accommodations can secure them near the place of meeting by applying in advance to Dr. D. O. M. LeCron, Missouri Trust Building, St. Louis, Mo., U. S. A.

Returning, leaving St. Louis by way of the Pennsylvania Railway, the route is through Terre Haute, Indianapolis, Springfield, Columbus, Pittsburg, and Harrisburg, thence to Washington the capital of the United States, where stop-over privileges have been secured for those who may desire to spend a little time in seeing the most beautiful and interesting city in America. From Washington through Baltimore and Philadelphia, where stop-over privileges have also been secured, and thence to New York.

The rate for the round trip from New York, exclusive of sleeping-car charge and subsistence, is \$32.35. Arrangements have been made for any who may desire to return from St. Louis via the Big Four, Lake Shore, and Michigan Southern and the New York Central railways to New York.

Those who desire to take advantage of this itinerary should communicate with Dr. Deane or Dr. Goode of the New York Reception Committee, notifying either of them of the date of arrival and by what steamship line.

Membership in the Congress.

The following are the rules governing membership in the Fourth International Dental Congress, submitted by the Committee on Membership and approved by the Committee of Organization:

I. All reputable practitioners of dental and oral surgery who are entitled to membership in representative state, district, or local dental associations where they reside are eligible for membership in the Congress.

II. The state conference committees in America, and the national chairman of each foreign country have authority to receipt for

the membership fee, which, with the application for membership, shall be forwarded to the chairman of the Finance Committee, Dr. C. S. Butler, 680 Main st., Buffalo, N. Y., who will thereupon forward the official credentials conferring membership in the Congress.

III. If any difference of opinion arises in state committees or national committees as to the eligibility of an applicant for membership, the question shall be referred to the Committee on Membership of the Congress.

IV. The wives and children of the members of the Congress may be admitted upon special request and by consent of the Committee on Membership.

V. A uniform fee of ten dollars shall be paid for each membership, and each person whose name appears on the program either as essayist or clinician must be a paid member of the Congress.

J. D. PATTERSON,
Ch'man Com. on Membership,
Kansas City, Mo., U. S. A.

Membership in the Congress will entitle the holder to all the privileges of debate and discussion of papers, and the right to vote upon all questions which the Congress will be called upon to decide. It will also entitle the members to participate in all the social functions of the Congress under the same conditions as enjoyed by others; to the official badges and insignia of the Congress; to one copy of the complete volumes of the Transactions, which it is anticipated will comprise not less than four volumes of about five hundred pages each. Judging from the material already offered, it is believed that the Transactions of the Congress will be the most complete exposition of modern dentistry yet published. This work will be sent to every member, whether he is able to be present at the Congress or not.

In order to avoid confusion and crowding of work at the last minute, those intending to apply for membership in the Congress are urged to send in their applications at once, which will give time to correct any error should one by chance occur.

All communications of a scientific nature must be submitted to the Committee on Essays for approval before

final acceptance for a place upon the program. All communications to the literary program of the Congress from foreign countries must receive the approval of the national committee of the respective countries from which they are sent before they can be accepted by the Committee on Essays of the Congress. Each essay must be accompanied by a *résumé* giving the substance of the communication in an epitomized form, which must be in the hands of the Essay Committee thirty days before the opening of the Congress, in order to give opportunity for translation and printing in advance of the Congress, and in order to secure a position upon the official program. All essays, titles of essays, and *résumés* thereof should be forwarded to Dr. Wilbur F. Litch, 1500 Locust st., Philadelphia, Pa., U. S. A., or to the secretary of the Committee of Organization.

Clinics.

All who intend to give clinical demonstrations should communicate with Dr. J. P. Gray, 212 N. Spruce st., Nashville, Tenn., U. S. A., chairman of the Committee on Clinics, who will make the necessary arrangements and supply suitable patients as far as may be possible. The rules governing the approval of literary communications by the several national committees will govern also the clinical demonstrations, and all arrangements for clinical demonstrations must be completed by August 1st in order to secure space and a place upon the program.

Exhibits.

All exhibits of a technical character relating to dentistry will be arranged for by the chairman of the Committee on Exhibits, Dr. D. M. Gallie, 100 State st., Chicago, Ill., U. S. A., to whom all applications should be made for space. All exhibits relating to dental education will be provided for upon application to Dr. Truman W. Brophy, Marshall Field Building, Chicago, Ill., U. S. A., chair-

man of Section IX—Education, Nomenclature, Literature, and History.

Prizes.

The Committee of Organization offers two prizes, viz, a handsome gold medal for the best essay on any subject pertaining to dentistry, and a similar medal for the best exhibit of an archæological character illustrating the development of dental art. All essays in competition for the gold medal prize are to be forwarded to Dr. James Truman, 4505 Chester ave., Philadelphia, Pa., U. S. A., chairman of the Committee on Prize Essays, without the name of the author attached, and designated by a motto, accompanied by a sealed envelope containing the name of the author and bearing upon its outside a duplicate of the motto upon the essay. The committee after having decided upon the respective merits of the essays and after having selected that one deemed worthy of the medal, will open the envelope bearing the duplicate motto and announce the name of the successful author. The other communications will be destroyed *incognito* six months after the Congress closes unless return of the unsuccessful essays be requested by the authors thereof within that period; or, at the option of the writers, the competing essays which fail to secure the medal may be referred to the Essay Committee for presentation before the Congress. The successful prize essay will be published as a part of the proceedings of the Congress.

The awarding of the prize for the archæological exhibit will be made by a committee to be appointed specially for that purpose. All exhibits competing for this medal will be cared for by the chairman of the Committee on Exhibits, Dr. D. M. Gallie, 100 State st., Chicago, Ill., U. S. A.

Medal.

The Committee of Organization has authorized the striking of a bronze medal commemorative of the Fourth Interna-

tional Congress. This handsome souvenir should be in the possession of every member of the Congress, as it is not only a beautiful work of art and intrinsically valuable as such, but it will be a memento of the greatest Congress of dentists ever held. The illustration is a half-tone reproduction of the artist's sketch and is worthy of careful study.



The figure upon the obverse side—that of St. Apollonia, which has been selected to typify dentistry—is one which not only serves the symbolic end, but one which lends itself particularly well to artistic treatment. The original design from which the illustration is reproduced is an artistic representation which has both merit and beauty. The symbolism of the reverse of the medal has been given ample consideration, and it is such as should meet with general approval. The universality and international character of the Congress movement is typified by the continental divisions of the world. The associated dates at the top of the design are those which embrace the professional life-history of dentistry. Falling gracefully down be-

tween the continents is a scroll upon which are to be inscribed the names of the recognized fathers of dentistry in all countries, each national body being asked to nominate the name or names to represent the respective countries. The pose of the eagle represents the auspices under which the Congress is to be held, and the palm branch a tribute of honor on behalf of the American profession to the fathers of dentistry.

The execution of the dies has been entrusted to the most expert die-sinker in America. The design is in high relief, and the medal will be struck in bronze, and will be about two and one-half inches in diameter. It will be a finished work of art in all respects, and an attractive and interesting souvenir of the great meeting which it typifies.

The medal will be supplied only to those who make application for it in advance of the Congress, as the number struck will be limited to the number subscribed for. The price of the medal without a case has been fixed at five dollars. Cases for the medal will be furnished at prices corresponding with their character and quality.

Those who desire to secure one of these souvenir medals will forward the amount of the subscription to Dr. Chas. S. Butler, chairman of the Finance Committee, 680 Main st., Buffalo, and the medal will be sent before the opening of the Congress. No medals will be available beyond the number subscribed for in advance of the Congress.

Present State of Organization.

The chairman of the Committee of Organization through Senator Depew has secured from Secretary of State the Hon. John Hay a promise to send through our foreign ambassadors and representatives an invitation on behalf of our government to all governments with which the United States is in diplomatic relation to send an official delegate to the Congress, and the Secretary has received notification that these invitations have been issued.

Upward of twenty nations have signified their intention to take part in this great Congress. No fewer than fifteen hundred committeemen are now actively at work promoting the success of the meeting. Every state and territory in the United States is in charge of a state committee actively at work in developing the details of the Congress in a local way. So that the prospect of an unusually large attendance is practically assured, and it is confidently expected that the membership in the Fourth International Dental Congress will be much in excess of any other dental meeting ever held. The number and character of essays already prepared, the number and character of the clinical demonstrations, the magnitude of the exhibits already arranged for, will surpass in these features all previous dental meetings. The work which has been accomplished by the Committee on Education, Legislation, and Dental History will constitute the most extensive contributions to these departments yet made.

The social features of the Congress are being provided for upon an elaborate plan. Receptions, luncheons, and various forms of entertainment are being arranged on a scale commensurate with the magnitude and importance of the meeting, and as much time will be given to the amenities of social intercourse as may be consistent with the more serious features of the program.

The Fourth International Dental Congress is now an assured success, and, judged from any standpoint, it will be a meeting which will not only adequately set forth the most recent developments of dental science and art, but it will constitute a liberal education in dentistry which no progressive practitioner can afford to miss.

An efficient corps of interpreters has been provided to assist those visiting members who are unfamiliar with the English language.

EDWARD C. KIRK, *Secretary*
Committee of Organization.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization of the Congress.

H. J. BURKHART, Chairman,
Batavia, N. Y.

E. C. KIRK, Secretary,
Lock Box 1615, Philadelphia, Pa.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer, 1420 Chestnut st., Philadelphia, Pa.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen, 1005 Sutter st., San Francisco, Cal.
- IV. Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.
- VI. Orthodontia. Chairman, E. H. Angle, 1023 N. Grand ave., St. Louis, Mo.
- VII. Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.
- VIII. Prosthesis. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.
- IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy, Marshall Field Bldg., Chicago, Ill.
- X. Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Committees.

Following are the committees appointed:

Finance. Chairman, C. S. Butler, 680 Main st., Buffalo, N. Y.

Program. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Exhibits. Chairman, D. M. Gallie, 100 State st., Chicago, Ill.

Transportation. (To be appointed.)

Reception. Chairman, B. Holly Smith, 1007 Madison ave., Baltimore, Md.

Registration. Chairman, B. L. Thorpe, 3666 Olive st., St. Louis, Mo.

Printing and Publication. Chairman, W. E. Boardman, 184 Boylston st., Boston, Mass.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey, 524 Penn ave., Pittsburg, Pa.

Dental Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel, 527½ Church st., Nashville, Tenn.

Membership. Chairman, J. D. Patterson, Keith and Perry Bldg., Kansas City, Mo.

Educational Methods. Chairman, T. W. Brophy, Marshall Field Bldg., Chicago, Ill.

Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

Prosthetic Dentistry. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.

Local Committee of Arrangements and Reception. Chairman, Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Essays. Chairman, Wilbur F. Litch, 1500 Locust st., Philadelphia, Pa.

History of Dentistry. Chairman, Wm. H. Trueman, 900 Spruce st., Philadelphia, Pa.

Nomenclature. Chairman, A. H. Thompson, 720 Kansas ave., Topeka, Kans.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally, 1018 14th st., N. W., Washington, D. C.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown, 175 Newbury st., Boston, Mass.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.

Prize Essays. Chairman, James Truman, 4505 Chester ave., Philadelphia, Pa.

Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.

Resolutions. Chairman, J. Y. Crawford, Jackson Bldg., Nashville, Tenn.

Clinics. Chairman, J. P. Gray, 212 N. Spruce st., Nashville, Tenn.

Nominations. Chairman, A. H. Peck, 92 State st., Chicago, Ill. W. E. Boardman, 184 Boylston st., Boston, Mass. M. R. Windhorst, 3518 Morgan st., St. Louis, Mo. Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Ad Interim. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

The officers of the Congress, honorary presidents, president, active vice-presidents, secretary-general, assistant secretaries and a treasurer will be nominated by the Nominating Committee—composed of two members of the Committee of Organization and two members of the Federation (F. D. I.) Committee, in accordance with instructions from the Director of Congresses, Hon. Howard J. Rogers.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be

held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.
DAVID R. FRANCIS, *President of Exposition*.

Fourth International Dental Congress.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

J. A. LIBBEY, *Chairman*,
524 Penn Avenue, Pittsburg, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing membership as prescribed by the Committee on Membership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of*

dentistry. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state chairman, whose indorsement is a certification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the committee earnestly appeals to each eligible practitioner in the United States who is interested in the success of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are—

General Chairman.

J. A. LIBBEY, 524 Penn Ave., Pittsburg, Pa.

Vice-Chairman.

WM. CONRAD, 3666 Olive St., St. Louis, Mo.

State Chairmen.

Alabama. H. CLAY HASSELL, Tuscaloosa.
 Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.
 California. J. L. PEASE, Central Bank Bldg., Oakland.
 Colorado. H. A. FYNN, 500 California Bldg., Denver.
 Connecticut. HENRY McMANUS, 80 Pratt St., Hartford.
 Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.
 District of Columbia. W. N. COGAN, The Sherman, Washington.
 Florida. W. G. MASON, Tampa.
 Georgia. H. H. JOHNSON, Macon.
 Hawaii. M. E. GROSSMAN, Box 744, Honolulu.
 Idaho. J. B. BURNS, Payette.
 Illinois. J. E. HINKINS, 131 E. 53d St., Chicago.
 Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.
 Iowa. W. R. CLACK, Clear Lake.
 Kansas. G. A. ESTERLY, Lawrence.
 Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.
 Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.
 Maine. H. A. KELLEY, 609 Congress St., Portland.
 Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.
 Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.
 Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.
 Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.
 Mississippi. W. R. WRIGHT, Jackson.
 Missouri. J. W. HULL, Altman Bldg., Kansas City.
 Montana. G. E. LONGEWAY, Great Falls.
 Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.
 New Hampshire. E. C. BLAISDELL, Portsmouth.
 New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.
 New York. B. C. NASH, 142 W. 78th St., New York City.
 N. Carolina. C. L. ALEXANDER, Charlotte.
 N. Dakota. ALBERT HALLENBURG, Fargo.
 Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.

Oklahoma. T. P. BRINGHURST, Shawnee.
 Oregon. S. J. BARBER, Macleay Bldg., Portland.
 Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.
 Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.
 South Carolina. J. T. CALVERT, Spartanburg.
 South Dakota. E. S. O'NEIL, Canton.
 Tennessee. W. P. SIMS, Jackson Bldg., Nashville.
 Texas. J. G. FIFE, Dallas.
 Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.
 Vermont. S. D. HODGE, Burlington.
 Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.
 Washington. G. W. STRYKER, Everett.
 West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.
 Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.

For the Committee of Organization,

EDWARD C. KIRK, *Secretary*.

Fourth International Dental Congress.

REPORT OF THE COMMITTEE ON NOMINATIONS.

The Nominating Committee appointed by the Committee of Organization of the Fourth International Dental Congress presented the following nominations for officers of the Fourth International Dental Congress [the list as here given embracing corrections and acceptances to date of publication]:

"President"—H. J. Burkhart, Batavia, N. Y.

"Honorary Presidents"—James Truman, Philadelphia, Pa. A. H. Fuller, St. Louis, Mo. G. V. Black, Chicago, Ill. Thomas Fillebrown, Boston, Mass. S. G. Perry, New York, N. Y. Gordon White, Nashville, Tenn. E. T. Darby, Philadelphia, Pa. James McManus, Hartford, Conn. G. A. Bowman, St. Louis, Mo. H. A. Smith, Cincinnati, O. T. W. Brophy, Chicago, Ill. Wm. Jarvie, Brooklyn, N. Y. Wm. Conrad, St. Louis, Mo. M. R. Windhorst, St. Louis, Mo. S. H. Guilford, Philadelphia, Pa. J. D. Patterson, Kansas City, Mo. C. C. Chittenden, Madison, Wis. Wm. Carr, New York, N. Y. E. H. Smith, Boston, Mass. M. H. Cryer, Philadelphia, Pa. E. A. Bogue, New York, N. Y.

V. E. Turner, Raleigh, N. C. A. L. Northrop, New York, N. Y. S. A. Freeman, Buffalo, N. Y. Wm. Crenshaw, Atlanta, Ga. J. W. David, Corsicana, Texas. J. Hall Moore, Richmond, Va. C. Newlin Peirce, Philadelphia, Pa. B. Holly Smith, Baltimore, Md. H. E. Beach, Clarksville, Tenn.

"Vice-Presidents"—A. H. Thompson, Topeka, Kans. J. G. Reid, Chicago, Ill. George Fields, Detroit, Mich. Garrett Newkirk, Los Angeles, Cal. R. Ottolengui, New York, N. Y. R. M. Sanger, East Orange, N. J. D. N. Rust, Washington, D. C. N. S. Hoff, Ann Arbor, Mich. L. P. Bethel, Columbus, O. Jules J. Sarrazin, New Orleans, La. Chas. L. Alexander, Charlotte, N. C. C. H. Darby, St. Joseph, Mo. B. C. Nash, New York, N. Y. G. S. Vann, Gadsden, Ala. B. F. Luckey, Paterson, N. J. E. R. Warner, Denver, Colo. Wms. Donnally, Washington, D. C. Frank Holland, Atlanta, Ga. W. P. Dickinson, Minneapolis, Minn. E. K. Wedelstaedt, St. Paul, Minn. Adam Flickinger, St. Louis, Mo. V. H. Jackson, New York, N. Y. J. M. Whitney, Honolulu, Hawaii. Louis Ottofy, Manila, P. I. Cyrus M. Gingrich, Baltimore, Md. H. B. Tileston, Louisville, Ky. J. F. Dowsley, Boston, Mass. George E. Hunt, Indianapolis, Ind. M. S. Merchant, Giddings, Tex. M. L. Rhein, New York, N. Y. G. S. Shattuck, Detroit, Mich. W. L. Reed, Mexico, Mo. S. Leslie LeCron, Baltimore, Md.

"Secretary-General"—Edward C. Kirk, Philadelphia, Pa.

"Treasurer"—M. F. Finley, Washington, D. C.

"Committee to Nominate Honorary Presidents and Vice-Presidents for Foreign Countries"—Edward C. Kirk, Philadelphia, Pa. Edward H. Angle, St. Louis, Mo. Wilbur F. Litch, Philadelphia, Pa."

Fourth International Dental Congress.

OFFICIAL THROUGH TRAIN TO ST. LOUIS,

LEAVING NEW YORK CITY ON SATURDAY,
AUGUST 27TH.

AN official through train consisting of sleepers, dining car, observation car, and buffet-library-smoking car, will leave New York city, via New York Central Railway, on Saturday, August 27th, at 10 A.M., passing Albany at 1.15 P.M., connecting with trains from Boston and New England; passing Syracuse at 6 P.M., Rochester at 7.42 P.M., arriving at Buffalo at 9 P.M., leaving Buffalo (via

Lake Shore Railway) at 9.20 p.m., passing Cleveland at 12.20 night, thence via "Big Four" Railroad, arriving in St. Louis about noon Sunday, August 28th.

Round trip ticket, fifteen-day limit, from New York, returning from St. Louis either direct or via Chicago and Alton Railway to Chicago, and Lake Shore Railway, with stop-over at Chicago and Niagara Falls, \$26.25. Sixty-day limit, \$32.25. These rates are exclusive of sleeping car.

Members living in the vicinity of New York will join the official train at New York city, and those from Philadelphia and vicinity at Buffalo. The same rates and accommodations can be secured via the Lehigh Valley Railway to Buffalo, thence to St. Louis from Philadelphia and vicinity as via any other direct line.

For information regarding reservation of berths, tickets, etc., from New York, Philadelphia, New Jersey, and New England, apply at once to Dr. W. C. Deane, 114 East 60th st., New York city. From Western New York and Canada, to Dr. F. E. Howard, 331 Franklin st., Buffalo, N. Y.

For the accommodation of those in the party hotel reservations in St. Louis should be made at the Jefferson Hotel, headquarters of the Congress, not later than August 1st, either direct or through Dr. D. O. M. LeCron, Missouri Trust Building, St. Louis, Mo.

Fraternally,

W. C. DEANE,
114 East 60th st., New York, N. Y.

FOURTH INTERNATIONAL DENTAL CONGRESS BANQUET.

THE banquet of the Fourth International Dental Congress will be held September 1, 1904, at 8 p.m., in the Coliseum, adjoining the Congress Hall.

The price per plate will be three dollars. It is requested that all who expect to attend send their names and money to Dr. A. H. Fuller, P. O. lock box 604, St. Louis, Mo., at once—and not later than August 20th. Arrangements to pay can be made with Dr. A. H. Fuller at the time of registration, provided notice be given before August 20th.

G. A. BOWMAN,
A. H. FULLER,
ADAM FLICKINGER,
Banquet Committee.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

THE next (fourth annual) meeting will be held in the Coliseum Building, St. Louis, Mo., August 26 and 27, 1904.

The first session will convene under the presidency of Dr. Charles Godon at 11 a.m. There will be a meeting of the Executive Council on Thursday (the 25th), at the Hotel Jefferson, at 10 a.m. The Section on Education will meet at 3 p.m. Friday. The Section on Hygiene and Public Dental Service will meet at 3 p.m. Friday. The Section on International Dental Press will meet at 4.30 p.m. Friday.

OFFICERS OF THE SECTIONS.

Education. President: T. W. Brophy. Vice-presidents: E. C. Kirk, W. B. Paterson, and O. Zsigmondy. Secretaries: Maurice Roy and R. B. Weiser.

Hygiene and Public Dental Service. President: W. D. Miller. Vice-presidents: Geo. Cunningham, E. Förberg, N. S. Jenkins, and C. Röse. Secretaries: R. Heidé, E. Sauvez, and R. B. Weiser.

International Dental Press. President: E. Förberg. Vice-president: A. W. Harlan. Secretary: E. Papot.

Executive Council. President: Charles Godon. Vice-presidents: A. W. Harlan, and W. D. Miller. Secretary: E. Sauvez. Treasurer: F. Aguilar. *Members:* Geo. Cunningham, E. Förberg, R. B. Weiser, J. E. Grevers, F. Heidé, O. Klingelhöfer.

On behalf of the Federation,

A. W. HARLAN, *Vice-president*,
1122 Broadway, New York, N. Y.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their annual meeting in the Coliseum building, corner Thirteenth and Olive streets, St. Louis, Mo., on August 25, 26, and 27, 1904, beginning promptly at 10 a.m. Telephone and telegraph offices in the building.

The committee on railroad accommodations for the East have made arrangements for fast through Pullman service to St. Louis from New York with the Delaware and Lackawana

Railroad. Two special Pullman cars will leave New York Tuesday, August 23d, at 10 A.M. The cost of our excursion, including berth each way, will be \$35.50. A proportionate reduction is made for those going from Buffalo, Toledo, Fort Wayne, and cities on the line connecting with the Wabash Railroad. Those who desire to go by the special train should send notice as promptly as possible to Charles A. Meeker, D.D.S., secretary of the National Association, or to Guy Adams, division passenger agent of the Delaware and Lackawana Railroad.

Accommodations have been secured for the National Association of Dental Examiners at the Franklin Hotel—a first-class hotel—north-west corner of Sarah and Westminster Place,

with rates from \$1.50 to \$6.00 per day, European plan. Secure rooms by writing to E. C. Dunnivant, St. Louis Service Company, Seventh and Olive sts., St. Louis, Mo.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

AMERICAN SOCIETY OF ORTHODONTISTS.

A SPECIAL meeting of the American Society of Orthodontists will be held in the rooms of the Orthodontia Section of the Fourth International Dental Congress in the Coliseum, St. Louis, at 10 A.M., August 29, 1904.

ANNA HOPKINS, *Sec'y*.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

July and August 1904.

JULY.

MAINE DENTAL SOCIETY. Bangor. Three days: July 19th to 21st.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 20th to 22d.

NORTHERN IOWA DENTAL SOCIETY. Waterloo. Three days: July 26th to 28th.

PENNSYLVANIA STATE DENTAL SOCIETY. Wilkesbarre. Three days: July 12th to 14th.

RED RIVER VALLEY DENTAL SOCIETY. Grand Forks, N. D. July 4th.

SOUTH CAROLINA STATE DENTAL SOCIETY. White Stone Lithia Springs. Four days: July 19th to 22d.

WISCONSIN STATE DENTAL SOCIETY. Manitowoc. Three days: July 19th to 21st.

AUGUST.

AMERICAN SOCIETY OF ORTHODONTISTS. St. Louis, Mo. August 29th.

FOURTH INTERNATIONAL DENTAL CONGRESS. St. Louis, Mo. Six days: August 29th to September 3d.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. St. Louis. Three days: August 25th to 27th.

VIRGINIA STATE DENTAL ASSOCIATION. Old Point Comfort. Three days: Aug. 2d to 4th.

State Board Meetings.

DENTAL COMMISSIONERS OF CONNECTICUT. Hartford. July 14th to 16th.

NEW JERSEY BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY. Trenton. July 5th to 7th.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS. White Stone Lithia Springs. July 15th.

VERMONT BOARD OF DENTAL EXAMINERS. Montpelier. July 5th.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE thirty-sixth annual meeting of the Pennsylvania State Dental Society will be held at the Hotel Sterling, Wilkesbarre, Pa., on Tuesday, Wednesday, and Thursday, July 12 to 14, 1904.

The convention will be called to order at 10 A.M. on Tuesday.

Every effort is being made to make this the most interesting and useful meeting of our society. The Executive Committee promise a very full program, including among its essayists Drs. B. Holly Smith, Baltimore; M. H. Cryer and Edward C. Kirk, Philadelphia; Gordon White, Nashville, Tenn., and Dr.

Anema of the Netherlands. Besides these, a number of prominent clinicians, each demonstrating some specialty of dentistry, have volunteered to give their time and skill for the good of the profession and to help to make the meeting a successful one.

All reputable practitioners of the profession are cordially invited to attend the meeting.

GEORGE W. CUPIT, *Sec'y*,
1420 Chestnut st., Philadelphia, Pa.

NORTHERN IOWA DENTAL SOCIETY.

THE annual meeting of the Northern Iowa Dental Society will be held at Waterloo, Iowa, July 26, 27, and 28, 1904.

A strong effort is being made to have a meeting as good as the best.

Reduced railroad rates may be secured on these dates from any point in the state.

C. L. TOPLIFF, *Sec'y*, Decorah, Iowa.

SOUTH CAROLINA STATE DENTAL SOCIETY.

THE thirty-fourth annual meeting of the South Carolina State Dental Society will be held at the White Stone Lithia Springs, White Stone, S. C., July 19, 20, 21, and 22, 1904.

We anticipate a pleasant as well as a profitable meeting, and a cordial invitation is extended to all.

E. J. ETHEREDGE, *Sec'y*, Leesville, S. C.

MAINE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Maine Dental Society will be held in Bangor, Me., July 19, 20, and 21, 1904.

All ethical dentists are invited to attend, and we especially extend an invitation to natives who are practicing out of the state to make this a "home week." We expect men of national reputation to give clinics and read papers.

Reduced rates will be given on transportation and at hotels.

WILL S. PAYSON, *Ch'man Ex. Com.*,
Castine, Me.

WISCONSIN STATE DENTAL SOCIETY.

THE thirty-fourth annual meeting of the Wisconsin State Dental Society will be held in Manitowoc, July 19 to 21, 1904. A cordial invitation is extended to all ethical practitioners to meet with us.

A. G. FEE, *Pres.*,
W. H. MUELLER, *Sec'y*,
Madison, Wis.

NORTHERN INDIANA DENTAL SOCIETY.

THE sixteenth annual meeting of the Northern Indiana Dental Society will be held in Huntingdon, Ind., on October 4 and 5, 1904.

Arrangements are being made to make this the greatest convention ever held in Northern Indiana. Already some of the best talent in the country has been secured.

OTTO U. KING, *Sec'y*, Huntingdon, Ind.

VIRGINIA STATE DENTAL ASSOCIATION.

THE thirty-fifth annual meeting of the Virginia State Dental Association will be held in the Chamberlain Hotel, Old Point Comfort, Va., August 2, 3, and 4, 1904. Reduced rates for members of the association and our guests. A cordial invitation is extended to our brethren of other states.

J. HALL MOORE, *Cor. Sec'y*.

DELTA SIGMA DELTA FRATERNITY.

MEETING OF THE SUPREME CHAPTER.

THE twentieth annual meeting of the Supreme Chapter, Delta Sigma Delta Fraternity, will be held Wednesday, August 31, 1904, at St. Louis, Mo. George E. Hunt, 131 E. Ohio st., Indianapolis, is chairman of the Committee on Arrangements.

CANADIAN DENTAL ASSOCIATION.

THERE will be a meeting of the Canadian Dental Association at Toronto, Ont., September 6, 7, and 8, 1904.

W. CECIL TROTTER, *Sec'y*, Toronto, Ont.

SWEDISH DENTAL SOCIETY.**NOTICE OF PRIZE COMPETITION.**

THE Swedish Dental Society announces the opening of a competition for the writing of a popular treatise, to be entitled "The Teeth and Their Care," intended for liberal distribution by the members of the society among persons of those classes in which hygienic care of the mouth is practically unknown. The treatise must be written in the Swedish language, and must not exceed one printed sheet. The competition is open to all members of the dental profession.

Each essay should bear a motto or mark, and should be accompanied by a sealed envelope containing on the outside the same motto or mark, but bearing no indication as to its origin, and within containing the name and address of the author. The essay, preferably typewritten, should be forwarded, duly signed, not later than February 28, 1905, to the "Jury of the Swedish Dental Society," 19 Drottninggatan, Stockholm.

The committee appointed to pass on the merits of the essays that may be submitted will primarily consider whether they fulfill the purpose of a popular treatise on the teeth and their care intended for the instruction of the rising generation in the schools and the information of the lower classes of the people. The essay should embody a plain and easily assimilable statement of the subject, free from dry details and needlessly lengthy descriptions. Original illustrations or reproductions of any already published may be incorporated to facilitate the understanding of the text. Authors should base their statements on strictly scientific facts, excluding hypotheses and doubtful theories.

The awards will be—First prize, 700 kroner (\$185); second prize, 300 kroner (\$80).

The jury appointed by the society consists of the following members: Profs. E. Almqvist and A. Lindström, with Prof. C. Wallis as alternate; also, Drs. V. Bensow, E. Förberg, and G. Forssman, with Dr. G. Modin as alternate.

The prize essays to become the property of the Swedish Dental Society.

On behalf of the Swedish Dental Society,

EMIL CHRISTENSON,
HARALD RAMBERG.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-fourth annual session of the New Jersey State Dental Society will convene in the Auditorium, Asbury Park, N. J., at 10 A.M., Wednesday, July 20, 1904, and continue in session Thursday and Friday. Asbury Park is one of the great Atlantic coast watering-places contiguous to New York and Philadelphia. The Auditorium will hold three thousand people, and is open on every side.

Fifty clinics will be given by men from north, south, east, and west, most eminent in their profession, and will include the newest advances in all that pertains to operative and mechanical dentistry. The society feels that in the exhibits the latest and largest number of adjuncts to the successful practice of modern dentistry will repay a visit and inspection. Wednesday, July 20th, has been set aside as a special exhibitors' day. To get the full benefit of this, dentists should get to the meeting early. The essays will consist of five already accepted and the best obtainable.

The social to members and visiting friends will be provided for as usual, and on Thursday evening at 10.30 a "smoker" will be provided.

The Columbia Hotel will be the headquarters, with rates from \$2.50 to \$3.00 per day. Those desiring rooms must send in notice by July 1st.

The program as usual will be replete with information.

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

ILLINOIS STATE DENTAL SOCIETY.

At the meeting of the Illinois State Dental Society, held in Peoria, Ill., May 10, 11, and 12, 1904, the following officers were elected: C. N. Johnson, Chicago, president; W. F. Whalen, Peoria, vice-president; Elgin MaWhinney, Chicago, secretary; Chas P. Pruyn, Chicago, treasurer; J. T. Cummins, Metropolis City, librarian. New Members of Executive Council—G. E. Warren, Pontiac; O. L. Frazee, Springfield; C. E. Bentley, Chicago. Chairman Executive Committee—M. L. Hanaford, Rockford. Committee on Science and Literature—E. H. Allen, Freeport. Commit-

tee on Art and Invention—J. H. Prothero, Chicago. Supervisor of Clinics—S. F. Duncan, Joliet. Local Committee of Arrangements—L. W. Skidmore, Moline. Committee on Infraction of Code of Ethics—C. B. Rohland, Alton; A. J. Elmer, Rochelle; R. J. Cruise, Chicago. Examiners—Edm'd Noyes, Chicago; C. B. Sawyer, Jacksonville; T. F. Henry, Streator. *Ad interim* Committee—D. M. Gallie, Chicago; C. N. Johnson, Chicago; J. G. Reid, Chicago. Committee on Neurology—Edmund Noyes, Chicago; C. R. E. Koch, Chicago; C. B. Rohland, Alton. Publication Committee—Elgin MaWhinney, Chicago; T. L. Gilmer, Chicago; J. G. Reid, Chicago. Editor of Transactions—Edmund Noyes, Chicago.

The forty-first annual meeting will be held in Moline, May 9, 10, and 11, 1905.

ELGIN MAWHINNEY, *Sec'y*.

NEW YORK STATE DENTAL SOCIETY.

At the thirty-sixth annual meeting of the New York State Dental Society, held at Albany, May 13 and 14, 1904, the following officers were elected for the ensuing year: Wm. Jarvie, Brooklyn, president; W. A. White, Phelps, vice-president; Wm. C. Deane, New York, secretary; C. W. Stainton, Buffalo, treasurer; Ellison Hillyer, Brooklyn, corresponding secretary.

W. C. DEANE, *Sec'y*,

114 E. 60th st., New York.

NATIONAL CAPITAL DENTAL SOCIETY.

THE National Capital Dental Society was incorporated May 18, 1904, under the laws of the District of Columbia. The new organization has elected the following officers: Jas. A. Hunter, president; Wm. B. Daly, vice-president; Starr Parsons, recording secretary; J. K. Halley, corresponding secretary; Jesse B. Schafhirt, treasurer; Chester Beatty, librarian.

The society gives excellent promise of success. Its present membership numbers nineteen, and several applications are to be acted upon at its next meeting. The code of ethics of the National Dental Association has been incorporated in the constitution and by-laws of the society.

J. K. HALLEY, *Cor. Sec'y*.

WARREN (PA.) DENTAL ASSOCIATION.

THE dentists of Warren, Pa., have organized a dental society to be known as the Warren (Pa.) Dental Association. The membership is open to practitioners of dentistry in good standing. Meetings of a social and professional character are held the fourth Monday in each month.

The officers for the year are J. T. Danforth, president; V. H. McAlpin, vice-president; E. C. Thompson, secretary and treasurer.

E. C. THOMPSON, *Sec'y*, Warren, Pa.

TEXAS STATE DENTAL ASSOCIATION.

At the twenty-fourth annual meeting of the Texas State Dental Association, held at Corsicana, Texas, May 5, 6, and 7, 1904, the following officers were elected: Sam. G. Duff, president; Pitt S. Turner, first vice-president; W. R. Rathbone, second vice-president; Bush Jones, secretary and treasurer; A. F. Sonntag, curator of museum. Executive Committee—C. O. Webb, Chas. H. Edge, G. Wallace Staples.

The next convention will be at Austin, Texas, in 1905.

BUSH JONES, *Sec'y*, Dallas.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS.

THE South Carolina Board of Dental Examiners will meet at White Stone Lithia Springs, S. C., July 15, 1904.

E. J. ETHEREDGE, *Sec'y*, Leesville, S. C.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the theoretical branches in the assembly room of the State-house at Trenton, N. J., on July 5, 6, and 7, 1904, sessions beginning promptly at 9 A.M.

The practical prosthetic and practical operative work will be done in Newark. All applications must be in the hands of the secretary ten days prior to the examination.

For further information apply to

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

DENTAL COMMISSIONERS OF CONNECTICUT.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford, on Thursday, Friday, and Saturday, July 14, 15, and 16, 1904, respectively, to examine applicants for license to practice dentistry, and for the transaction of any other proper business.

The practical examination in operative and prosthetic dentistry will be held Thursday, July 14, at 9 A.M., in Putnam Phalanx Armory, corner Haynes and Pearl sts.

The written theoretic examination will be held Friday and Saturday, July 15 and 16, at the Capitol.

All applicants should apply to the Recorder for proper blanks, and for the revised rules for conducting the examinations.

Application blanks must be carefully filled in and sworn to, and with fee, twenty-five dollars, filed with the Recorder on or before July

7, 1904. Examination fee must be forwarded by money order or certified check. Enclose stamp.

By direction of the Dental Commissioners of Connecticut.

J. TENNEY BARKER, *Recorder*.

VERMONT BOARD OF DENTAL EXAMINERS.

THE Vermont Board of Dental Examiners will meet at Montpelier, Vt., on Tuesday, July 5, 1904, at 2 P.M., for the examination of candidates for license to practice dentistry. Headquarters will be at the Pavilion Hotel.

Application blanks, together with rules and instructions to candidates, can be had on application to the secretary. Application, with the fee—ten dollars—must be filed on or before June 27, 1904.

GEO. F. CHENEY, *Sec'y*,
St. Johnsbury, Vt.

DENTAL COLLEGE COMMENCEMENTS.

UNIVERSITY OF BUFFALO, DEPARTMENT OF DENTISTRY.

THE twelfth annual commencement exercises of the Department of Dentistry of the University of Buffalo were held Tuesday, May 3, 1904.

An address was delivered by Frank Hyatt Smith, A.M.

The degree of D.D.S. was conferred on the following graduates:

Clarence Robert Averill
Wesley Mason Backus
Lynn Berkeley Badgero
Ernest Rock Bailey
James Edward Barlow
Albert Wilson Beatty
Theron Coit Bliss
Glenn Kingston Brooks
Andrew Timothy Cahill
John Francis Clifford
Henry Graley Cody
John Augustine Collins
Edgar Charles Cooke
Ward Hallock Cowles
Claude Francis Demerath
David Alanson Diltz
George Thomas Ellis
Carl Ferdinand Eschelman
Charles Augustus Espie
Alpheus Vernon Fluhrer
John Frederick Folley
Elton Albert Foote

Leroy Heman Foote
Arthur James Foster
Walter Lowell Foster
Howard Thomas Gallagher
Donald Irving Gleason
Ernest Godfrey Graf
Warren Cogswell Greenfield
Mark Alexander Gregg
Fred Joseph Hall
Floyd Clinton Hart
Frank Morgan Howe
Daniel Edward Hurley
Howard Blish King
Francis Joseph Kelly
David Allen Lawton
Lloyd Elmer Leland
Frank Murel Leslie
James John Maloney
John Oppie McCall, A.B.
Daniel Francis McGillicuddy
Charles Michael McNeely

John Coatsworth Mesmer
Walter Lull Moore
Frank James Moyer, Jr.
Garnet Howard Morden
Grover Cleveland H. Murdoch
Alice Loretto Murphy
Robert Edmond Lee Northrup
Nathan Lee Otis
Earl Surrey Packwood
James Hadley Rasey
Herbert Elgene Read
Arthur Lawrence Reynolds
Clayton Alexander Sayers
Walter Evans Steacy
Frank House Tatlock
Clarence Albert Thorn
Peter Benjamin Van Wie
John Bernard West
Fred Bushnell Wilson
George Anson Wilson
John Ellsworth White

MILWAUKEE MEDICAL COLLEGE, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the Milwaukee Medical College were held in the Alhambra Theater, Milwaukee, May 2, 1904.

The doctorate address was delivered by Rev. Chas. H. Beale, D.D., and the valedictory address by Jas. D. Nelson.

The degree of D.D.S. was conferred by W. H. Earles, president, on the following graduates:

Melton O. Bentley	Henry Frederick Henneman	James David Nelson
Ben Henry Boerger	Frommhold Arno Holtz	Herman Ernst Pomrening
Cora Josephine Bryant	Ernst John Hoermann	August Frederick Pomrening
Otis Verlin Calkins	Wilson Thurston Hurd, Jr.	Michael Ulrik Poppe
Thomas Francis Dempsey	Frank Lorell Joslin	Phillip Charles Regan
Earl F. Dodge	Thomas Francis Kennedy	Thomas Henry Roach
Otto Alfred Droegekamp	Otto Reynold Kloehn	Roy Charles Rowley
Homer Hicks Fowle	Edward Gustav Kohlsdorf	Sterling C. Sacket
Samuel D. Friedman	Herbert Hugo Kreutzmann	Anton George Rozmarynowski
Christian Garfield Goelzer	Morris Herman Lewin	James Alexander Spalsbury
James Martin Hackett	Francis Sterling Lindow	William Frederick Straub
Frank Newell Hansen	Edward McCarten	Frank Wilson Straight
Arthur Henry Hansen	George Elmer Melchior	Bertram George Tainter
Erle Seltzer Harrison	Oscar Frank Meng	Charles Clarence Tuckwood
Walter George Heiliger	Charles Robert Morgenroth	Herman Henry Weickel
Carl Jonathan Hentschel	William Henry Morris	Frank Ezra Wing
Albert Frederick Hinz	James M. Nelson	Mabel Kathryn Younge

WESTERN DENTAL COLLEGE.

THE fourteenth annual commencement exercises of the Western Dental College were held at the High School auditorium, Kansas City, Monday, May 2, 1904.

The annual address was delivered by Dr. W. F. Kuhn.

The degree of D.D.S. was conferred by the dean, D. J. McMillan, M.D., D.D.S., on the following graduates:

George Aiken	I. H. Hendrickson	S. L. Owings
H. L. Aiken	J. D. Hill	C. B. Parsons
A. L. Billings	H. H. Hillis	J. R. Payne
L. D. Blachley	N. S. Hinshaw	A. N. Schofield
J. C. Boyd	Perry Hood	E. B. Sheaff
F. H. Burgin	Anton Hrabe	J. H. Sims
A. J. Caison	Chas. Kraus	C. R. Smithers
H. A. Carlock	T. W. Lind	S. D. Soash
A. B. Culp	A. D. Lucas	Chas. Steinmetz
C. M. Davis	W. L. McCormick	Howard Swan
Frank Edwards	Gertrude McGill	A. R. Talbott
F. Emley	Chas. B. McMahan	J. T. Talbott
W. R. Evans	H. H. Millard	W. C. Ward
Jno. W. Forney	Ray Mosley	C. H. Weaver
Maurice Fowler	Arthur Musgrave	A. G. Wilcox
Wilber Gish	J. H. Nichols	I. C. Wilson
Clarence Guy	Ed. A. Oliver	Gladys Younger
Earl Hallowell		

CHICAGO COLLEGE OF DENTAL SURGERY.

THE twenty-second annual commencement exercises of the Chicago College of Dental Surgery were held in the Garrick Theater, Chicago, Ill., Tuesday, May 3, 1904.

Addresses were delivered by George E. Vincent, Ph.D., L. S. Tenney, D.D.S., and Wm. M. Lawrence, D.D.

The degree of D.D.S. was conferred by Truman W. Brophy, M.D., D.D.S., LL.D., president, on the following graduates:

Robert Samuel Arthurs	Robert Edward Hodson	William Leo Nerud
Lester Maxson Babcock, A.B	Jacobus M. Hooreman, M.D.	Fritz Valentine Newhouse
William McCall Baird	Frank William How	Benjamin Ira Norwood
Robert Lee Bantz	Charles Lloyd Huffman	Hal Nelson Orr
William Garfield Barackman	William Horace Hunter	William Edwin Page
George H. Barlow	Leslie Dana Hyland	Raymond Robert Pashley
George Edward Bell	Arthur Edward Irving	Virgil Pearlee Perisho
Earl Edward Blodgett	Justine Clement Iverson	Charles Henry Paul
Corydon Ansel Branch	William Le Roy Ivey	John Hardin Phinney
Frederic Albert Bricker	Clarence William Jackman	Edward C. Pickard, L.D.S.
Wesley A. Britzius	Norman Emmert Johnson	Hale A. Plankerton
Josaphat Louis Brunet	Edwin Clair Johnson	James Louis Quinlan
Joseph Dawson Buckley	Francis Patrick Joyce	Walter Frederick Raubolt
Franklin Budge	Edward John Kelley	Francis Evan Richards
Henry Leonard Burekhalter	George L. S. Kennedy	Arthur Reinhard Rietz
George Francis Burgess	Walter Wenzel Kieweg	Earl Clayton Robinson
William August Buscho	Peter Andreas Lerche	Lawrence Karrel Runkle
William Harvey Chapman	Earl Willis Lewis	Edward Pressley Rhea Ryan
Ellis Edward Chase	Charles Howard Libbey	Jay Vernon Saylor
Walter Thomas Clark	Eugene Anthony Liedl	Mathias Leonard Schmitz
George Andrew Clunie	George Hampson Liepart	John Baptist Hubert Senesac
John Angus Cook	Robert Everett Liggitt	Willard Parker Sharpe, Jr.
Thaddeus Erle Cougar	Clyde Thomas Liken	Frank Webster Shaw
Roy James Cruse	John Anselm Limacher	Kester Warren Snider
Andrew Irvin Denney	Samuel Elmer Lindley	George Hoxie Steele
Hiram Alvin Derickson	George William Loomans	Peter Engwald Steinback
John Victor Dexter	Robert Francis Lucas	Isaac Perry Stewart
Carl Otto Dick	Leonidas Irvin Luton	Hubert William Stott
Ralph Harvey Dixon	Otis Arthur Lyman	George Allen Samuel Stratton
Ezra King Douglas	John Elliott MacArthur	Eugene Frederick Strom
Samuel Eckel	Roy Stuart Macdonald	David James Sutton
Loren Eugene Ervin	Neil J. MacKechnie	Harry Edward Sykes
Frederick Alexander Estock	Edward Charles Magnuson	Daniel Preston Thomas
George Albert Follett	Daniel Arthur Maher	Theodore William Truitt
Michael Gregory Fox	Archibald A. Martin, L.D.S.	John Gottfrid Turner
Joseph Fulton	Charles Edward Martin	Earl Jay Van Buskirk
Miles Heraty Gallagher	Charles Henry Maynard	Elliott Van Alstine
John Robert Gift	Alexander Montrose Maypole	Albert Edward Voss
William Samuel Gilmer	Alexander McCarter	James Edwin Waldron
Samuel Chauncey Gould	Mark Thomas McMahon	William Brisbane Walker
Lewis Henry Harding	Charles Alfred McRae	John Walser, Jr.
James Benjamin Harmon	Naseef Melaik	Leslie Vernon Wareham
Edward Ewel Harris	Roy De Lacey Michener	Shirley Thomas Burgh Webber
Frank Alexandra Hautsch	Lewis Edward Molseed	Philippus A. M. Wege
Charles Davis Hermon	Ernest Rufus Morgan	Howard Flecker Whittaker
William Henry Hewitt	William Godfred Movius	Everett Crumly Worstell
Walter Gerald Hine	Sverre Holm Nannestad	Charles Lewis Wright
Ralph Burritt Hinman	Bernard Nauman	Elbert Clifton Young
George Alois Hirscher		

NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

THE annual commencement exercises of the Northwestern University Dental School were held at the Garrick Theater, Chicago, Ill., Thursday, May 5, 1904.

The doctorate address was delivered by Rev. Jenkin L. Jones; the salutatory by James S. Pierce; and the valedictory by Archie B. Hopper.

The degree of D.D.S. was conferred by Edmund J. James, Ph.D., LL.D., president of the university, on the following graduates:

Florence Ethel Abbott	Homer Jackson Harpole	Bunyan Warwick Ostrander
Thomas DeWitt Abernathy	Bert Alferd Harris	Ernest Williams Patton
Albert J. A. Bachmann	Madison Curtis Harris, A.B.	Charles Elfred Perry
Frederick George Bartsch	William Leonard Harrison	James Samuel Pierce
George Phillip Bay, Jr.	Benjamin Theodore Harsch	Lovejoy Pottle
Mace Bean	Holmes Weston Haviland	Merle Mayo Printz
Leslie Fosbrook Charles Beart	Eli George Heck	Thomas Henry Rand
John Marcus Beckett	Franklin Edward Heidel	Alfred Theodore Rasmussen
Walter Thomas Best	John Lewis Hesse	Robert George Richardson
John David Bohrer	Thomas Bruce Hill	Walter Harcourt Rimmer
Harry Alvin Boysen	Frederick Worth Hines	William Joseph Robinson
Henry Oswald Branstad	Arthur Edwin Hoag	Edwin Ralph Rossteuscher
Almon Edson Bronson	Oscar Renus Holmin	Raymond Julius Sauer
Fred Hugh Brosnihan	Leslie Ernest Arthur Hooley	Howard Bond Saunders, B.S.
Clarence Edwards Burgson	Archie Bertel Hopper	Emerson Robert R. Sawyer
Gordon Leigh Burke	Clarence Mell Horn	Herbert Shaw Seofield
Joseph George Cannon	John Henry Hospers, A.B.	Daniel Scholler
Walter W. Carlile	Edwin Benson House	Maria M. Schroeder
Robert Emmett Carlton	Ralph Thomas Huff	Arthur Edward Schuler
Roy Millard Carter	John Holman Humphrey	Bernhardt F. W. Schwartz
Joseph Benjamin Cecka	Hugh Chester Hurd	Benjamin Bear Shirk
Edward Ten Eyck Chandler	Harry Milton Johnson	Herbert Garfield Shumway
William Edward Chapline	Roger Theodore Jones	John Dorris Simms
Henry Bannister Clark	John Joseph Kelly	Albert Benjamin Slick, B.S.
Irving Alfred Clark	Edward Arthur Laign	Frank LeRoy Sluss
Timothy Joseph Creeden	Philip Forsyth Lamm	Edgar Wilson Smith
Guy Raymond Currier	James Rowland Laughlin	James Perrie Smith
Guilford Banning Davis	Eustace Porret Leakey	Martin Christian Stalland
Helen Towle Dearborn	Mae Burton Leavitt	Benjamin Swartout
Roy Joseph Denning	Charles Herman Lietzmann	Edward Luke Teskey
William Devlin	James Burgess Long	George Patterson Thompson
Harry D. Dillon	Erlow Bliss Loofboro	James William Thorpe
Leon LeRoy DuBois	Dorance Timothy Love	William Julius Thorson
Harry Parker Dunlop	Roy James Low	Morton Cranage Tilden
Charles Milton Emerson	Walter Garfield Lux, B.S.	Robert Francis Walter Tracy
Robert Wilson Fallis	Frank Clifton McClenahan	Walter Elbert Trerise
Oren Frederick Fansett	Eugene Percival McCowen	Harry Albert Truee
Emerson Godfred Fitzgerald	Clyde Isaiah McCumber	Harry Morehouse VanDeusen
John Alexander Ford	James McAdam McIntyre	Ralph Newton VanSant
Merritt Eugene Galbreath	Edward McQuillen	Harry I. VanTuyt, B.S., M.D.
Frank Willis Gale	Norman Arthur Macdonald	Meredith Watson
Melvin Edwin Gale	George Addison Madison	Frederick Harold Werner
Julius John Gaus	John Lyle Malcolm	Frederick Jacob Wetterer
John William Goggin	Glenn DeMotte Marr	William F. Roscoe Whorton
Marcus Wesley Gouse	John Lewis Mathews	Charles Arthur Wiese
William Joseph Gray	Miss Jennie Louise Miller	Evert Velie Williams
Hayden Boston Grayston	Orlen Jacob Miller	Hugh Richard Williams
Alexander Samuel Greenwood	Wesley Clarence Mittan	William Knox Wilson
Seward Clarence Grinde	Joseph Conness Mohan	Harry Augustus Wise
George Carlton Grove	Joseph Henry Moreau	Willard Jason Wiswall
Henry Quincy Guest	Benjamin Alder Murray	Bertram Guy Wood
Myron Francis Hagerup	Frederick Andrew H. Olsen	John Adam Wood
Baker Aaron Hamilton		

MEDICAL COLLEGE OF VIRGINIA, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the Medical College of Virginia were held at the Academy of Music, Richmond, Va., on Tuesday, May 10, 1904.

The degree of D.D.S. was conferred on the following graduates:

H. R. Cromartie.....	North Carolina	J. R. Perkins.....	Virginia
B. F. Eppes.....	Virginia	F. R. Talley.....	Virginia
R. M. Harris.....	Virginia	G. D. Taylor.....	Virginia
O. Hooks.....	North Carolina	W. P. Williams.....	Virginia
P. S. Lester.....	Virginia	A. C. Wright.....	Florida

NEW YORK DENTAL SCHOOL.

THE eleventh annual commencement exercises of the New York Dental School were held in Mendelssohn Hall, New York city, Monday, May 2, 1904.

The address to the graduates was delivered by Rev. Charles Townsend, D.D., and the valedictory by Harold Lyman Baldwin.

The degree of D.D.S. was conferred on the following graduates:

Evangeline Violet Agnew...	New York	Charles D. Kimball, A.B., M.D.	New York
Harold Lyman Baldwin....	New Jersey	Anna Mercy.....	Austria
Clarence Edgar Beers.....	New Jersey	Karl Muller.....	Germany
Nathan Bendin.....	Russia	David G. Pollock.....	New York
John Ralph Carrington....	Brit. W. Indies	Harry Reuben Radin.....	New Jersey
Wallace Horton De Groot...	New York	Marie Robbins.....	Russia
George Fichandler.....	Russia	Mohammed Sameh.....	Egypt
Albert Warren Gates.....	New York	Louis Schecht.....	New York
Sarah Goldstein.....	New York	Marie Schwartz.....	Russia
Andrew Hazel Gunn.....	New York	Harvey Edwin Stahl.....	New York
Sylvester Robert Husch.....	New York	Robert Stevenson.....	New Jersey
Frank Kern.....	Hungary	Isidore Phillip Thomas.....	New York

DETROIT COLLEGE OF MEDICINE, DENTAL DEPARTMENT.

THE annual commencement exercises of the Department of Dental Surgery, Detroit College of Medicine, were held at the Detroit Opera House, Tuesday evening, June 7, 1904.

An address was delivered by Rev. John McDowell. The valedictorian was George F. Hanna, D.D.S.

The degree of D.D.S. was conferred on the following graduates:

Robert F. Bruce	Simeon E. Hudson	Stafford J. Shannon
Frank J. Crevier	Louis B. Lemaire	John C. Walker
George F. Hanna	John W. Nichols	Howard A. Wing
Thomas B. Henderson	Wilson I. Rickards	

BARNES DENTAL COLLEGE.

THE first annual commencement exercises of the Barnes Dental College were held in the First Christian Church, St. Louis, Mo., Tuesday, May 3, 1904.

Addresses were delivered by Rev. John L. Brandt and by Dr. Burton Lee Thorpe, dean.

The degree of D.D.S. was conferred by Hon. John M. Wood, president of the board of trustees, on the graduate, J. Harry Lloyd.

UNIVERSITY OF PENNSYLVANIA, DEPARTMENT OF DENTISTRY.

THE one hundred and forty-eighth annual commencement exercises of the University of Pennsylvania were held at the American Academy of Music, Philadelphia, June 15, 1904.

The oration was delivered by Rev. Dr. David McConnell Steele.

The degree of D.D.S. was conferred by Charles C. Harrison, LL.D., provost of the university, on the following graduates:

Frank Lawrence Adams... New York
 Walter Bowne Allen..... New York
 Frederick F. Andrew..... New Jersey
 Ruhl Bacheller..... New York
 Edward Wood Baker..... New York
 Norton Leopold Baldauf... Kentucky
 Edward Joseph Barabe.... Michigan
 Horace Ephraim Barker... New Hampshire
 Enrico Barreiros..... Brazil
 Paul Leon Bassett..... New Jersey
 Irving W. Brown..... New York
 Robert Wallace Brown.... Pennsylvania
 Louis Bruce..... Ontario, Can.
 Russell Knowles Bryer... Rhode Island
 William Morley Cameron... Ontario, Can.
 James Dexter Carleton... Maine
 John Henry Carter..... New York
 Jean Francois X. Cauhepe.. France
 Asa Munson Chandler.... Pennsylvania
 Holbrook Alfred Chatfield.. New Zealand
 Francis Michael Close.... New York
 Arthur Francis Cornelius.. New York
 Emerson George Curry.... Ontario, Can.
 Walter Bernard Daehler... France
 George F. S. Dansey..... N. S. W., Aus.
 Eugene Leon P. Darciassac.. France
 Ernesto del Pino..... Mexico
 Georges Arthur Demeulle.. France
 Norman Sydney Deravin... Victoria, Aus.
 Frederick Joseph Ebert... Washington
 Zacharie Eudlitz..... France
 Alexander Ferguson..... Rhode Island
 Hardinge C. Fitzhardinge.. N. S. W., Aus.
 Frederick Robert Forster... Queensland, Aus.
 Arthur Russell Fraser.... New York
 Oscar Freudenfeld..... Austria
 Fred William Fuellhart... Pennsylvania
 Forry Rohrer Getz..... Pennsylvania
 Wilford Stanley Gladfelter.. Pennsylvania
 Carl Schurz Gleason..... Pennsylvania
 Charles Edwin Gold..... Pennsylvania
 Edward C. Greene..... Pennsylvania
 William Alexander Gunn... New Zealand
 Leonard Melcherton Gunton.. England
 Ezra Allen Hahn..... Pennsylvania
 Leonard Clive Hales..... New Zealand
 Francis Albert Harwood... Canada
 Ford Henderson Hayes.... Pennsylvania
 William MacA. Hendrie... New Jersey
 Julius Albert Hermann... New York
 Fredrich Paul Herrmann... Germany
 John William Hesse..... Georgia
 Albert Charles Hitzelberger.. New York
 Edwin Almus Holbrook... New York
 William C. P. Hough..... N. S. W., Aus.
 George Harrison Hubbard.. Pennsylvania
 George Edward Hutchinson.. Pennsylvania
 Andrew Francis Jackson... Chile
 Charles Homer Jacob..... Pennsylvania
 Norman Lee Jameson..... N. B., Canada

Aelyas Kassab..... Pennsylvania
 Howard S. Kiess..... Pennsylvania
 Ralph Raymond Kingsley... Pennsylvania
 Fred William Koons..... Pennsylvania
 P. C. Hollis Lapp..... Pennsylvania
 Francis Daniel Larson... Connecticut
 William Wheeler Leonard.. Connecticut
 Oborn G. L. Lewis..... Pennsylvania
 William D. Macdonald.... Connecticut
 Lester L. Macnamara.... Massachusetts
 Francis P. McEnerney... Connecticut
 Thomas Patrick McNulty... New York
 Leroy Robert Mahaffey... Pennsylvania
 Claude Mayham Mallery... New York
 Perley Haskell Markham... New York
 Laurence Sydney Marks... Victoria, Aus.
 Georges Martinier..... France
 Henri Masson..... France
 Frank Mellersh..... Devonshire, Eng.
 Albert Garfield Morrish... Pennsylvania
 Howard Osgood Moxom... Massachusetts
 Albert Llewellyn Mulford.. New Jersey
 Daniel Edward Myers.... Pennsylvania
 Emmett O'Neill, Jr..... Pennsylvania
 Hambly Samuel Orchard... New York
 Irvine Alexander Orton... Canada
 James Curtis Parsons... Virginia
 James Augustus Patten... Pennsylvania
 Filinto de M. Pedroso.... Brazil
 Herbert George Pettebone.. Pennsylvania
 Joseph Arthur Pierson... Australia
 Joseph Albert Potter.... Pennsylvania
 Francisco de P. Portuondo.. Cuba
 George Stanley Powell.... Victoria, Aus.
 Clarence Erwin Pyle.... Pennsylvania
 Andres E. Ros y Castillo... Cuba
 Albert Lewis Roth..... New York
 George Henry Rourke.... Massachusetts
 Ernest Nichols Ryder.... New York
 Sidney Alexander Sands... N. S. W., Aus.
 Vincent Rogers Sayward... Massachusetts
 Robert Earl Seyfert.... Pennsylvania
 Elwin Robert Shedden... Pennsylvania
 Oscar Senior..... Trinidad, B. W. I.
 Wolf Sklar..... Pennsylvania
 Philip Pawling Stalford... Connecticut
 John Clark Stillman.... New York
 William Manley Sullivan.. Massachusetts
 Georges A. Tanqueray... France
 Charles Stough Taylor... Pennsylvania
 Isaac Chalfant Tracy.... Pennsylvania
 Charles Murray Turpin... Pennsylvania
 Amos Parker Underwood... New Jersey
 J. Valderrama y Barrenechea.. Spain
 Amos Beeber Vastine.... Pennsylvania
 Ernest William Vickers... N. S. W., Aus.
 Charles Francis Welch... Massachusetts
 Raymond Gage Wildrick... New Jersey
 Percy Norman Williams... England
 William Isaac Zyner.... Pennsylvania

Degree conferred December 10, 1903.

Edgar Thomas Blocher.... Pennsylvania
 George Frederick DeLong.. Pennsylvania
 Francis Isaac Ferris..... Australia
 Ramiro Enrique Gamez.... Nicaragua

Henry Danvers Godden... New Zealand
 Howard Lacey Letts..... Iowa
 Robert Roy Parks..... Pennsylvania
 Harry Davis Winsmore... Pennsylvania

OHIO COLLEGE OF DENTAL SURGERY.

THE fifty-eighth annual commencement exercises of the Ohio College of Dental Surgery (Department of Dentistry, University of Cincinnati) were held at Cincinnati, Ohio, Thursday, May 5, 1904.

Addresses were delivered by S. B. Dyer and by George B. Lowry.

The degree of D.D.S. was conferred by Dr. Chas. I. Keely, secretary of the board of trustees, on the following graduates:

Erl R. Beatty.....	Pennsylvania	Sarah Lucy Huff.....	Kentucky
Robert C. Boggs.....	Kentucky	Lloyd S. Huhn.....	Pennsylvania
Carl H. Bowlby.....	Ohio	Frank A. Humphrey.....	Ohio
Charles A. Bradshaw.....	Ohio	Von Weber Hunt.....	Ohio
Edgar Christensen.....	Minnesota	Oscar Edmund Imig.....	Wisconsin
John F. Clark.....	Ohio	J. Gallitin Kearby.....	Texas
Stanley M. Clark.....	Kentucky	William F. Knemoeller.....	Ohio
Franklin B. Conkle.....	Ohio	Daniel J. Lloyd.....	Ohio
Frank T. Craven.....	Indiana	George B. Lowry.....	Ohio
Claude R. Crawford.....	Ohio	George F. McCombs.....	Indiana
Walter B. Dimond.....	Kentucky	Henry Edwin Motch.....	Kentucky
Arthur S. Devore.....	Texas	James H. Moyer.....	Ohio
John Eli Dysart.....	Ohio	William F. Outealt.....	Ohio
Gustav Eckstein.....	Ohio	Chester A. Peake.....	New York
Charles B. Emery.....	Ohio	Orion B. Pfouts.....	Ohio
Harry J. Emery.....	Indiana	P. Kendrick Phillips.....	Ohio
Frank L. Falknor.....	Ohio	Courtland L. Pollitt.....	Illinois
Clyde M. Gearhart.....	Ohio	Charles V. Pollock.....	Pennsylvania
Arthur O. Glass.....	Ohio	Hiram L. Scott.....	Ohio
David K. Goodman.....	Ohio	Jesse M. Scott.....	Ohio
John W. Gordon.....	Ohio	Joseph Park Shai.....	Ohio
Vernon M. Gregg.....	Ohio	Verna R. Shriner.....	Ohio
Daniel D. Griffith.....	Illinois	Warren A. Shurtz.....	Ohio
Joseph A. Grimes.....	Kentucky	Eddie Bay Smith.....	Ohio
Edward Everett Hadley.....	Iowa	S. Robert Snodgrass, M.A....	Ohio
Harry Leon Hale.....	Ohio	C. Edgar Srofe.....	Ohio
Russell F. Hale.....	Ohio	Randall H. Tinsley.....	Kentucky
Carl M. Harvey.....	Ohio	Robert C. Van Osdol.....	Indiana
Willie D. Herr.....	Kentucky	Ernest S. Walker.....	Pennsylvania
August J. Hibschan.....	Ohio	George O. Walton.....	Kentucky
Oliver C. Hill.....	West Virginia	Simeon G. Walton.....	Ohio
Kenworthy M. Hoge.....	Ohio	Harry Watson.....	Ohio
Hugh H. Holbrook.....	Ohio	Miss Catherine H. Whallon...	Ohio
Harold Holmes.....	Pennsylvania	Herbert S. Whitney.....	Ohio
Chester Perry Holt.....	Michigan	Clinton H. Woolgar, M.D....	Michigan
Joseph H. Howard.....	Missouri		

HOWARD UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of Howard University were held in the First Congregational Church, Washington, D. C., on Tuesday, May 10, 1904.

The charge to the class was delivered by Prof. Robert Reyburn, A.M., M.D.

The degree of D.D.S. was conferred by Rev. John Gordon, D.D., on the following graduates:

Webster Barton Beatty..	Illinois	Ezekiel N. Lawrence....	British West Indies
Edward Arthur Dash...	British West Indies	Rafael E. Sanchez.....	Cuba
Wilfred Stanley Duhaney	Jamaica	Wendell P. G. Urling...	Demerara
Jacob Astor Emerson...	North Carolina	John E. Washington....	District of Columbia
Jabez Arthur Fray.....	British West Indies	G. F. Watts, A.B.....	Georgia
Wesley W. Jefferson....	South Carolina		

UNIVERSITY OF TENNESSEE, DEPARTMENT OF DENTISTRY.

THE annual commencement exercises of the Dental Department of the University of Tennessee were held at Watkins Hall, Nashville, Tenn., Monday, May 2, 1904.

An address was delivered by Rev. W. M. Anderson.

The degree of D.D.S. was conferred by Hon. S. A. Mynders on the following graduates:

Wm. M. Baxter.....	Tennessee	E. H. Johnson.....	Tennessee
Oscar Brasfield	Tennessee	Roy Love.....	Arkansas
J. E. Camp	Tennessee	Edna Love.....	Missouri
John Caughron.....	Tennessee	T. M. McDonald.....	Tennessee
A. S. Delany.....	Texas	W. W. McMullen.....	Mississippi
H. K. Denton.....	Texas	Clyde U. Mayfield.....	Arkansas
Roland H. Fowlkes.....	Tennessee	J. A. Newman.....	Tennessee
L. D. Garlfb.....	Mississippi	T. L. Parker.....	Mississippi
L. J. Gilbert	Mississippi	John B. Ross.....	Mississippi
E. R. Harris	Tennessee	Bernice Sherrill.....	Missouri
Annie L. Harrison.....	Tennessee	B. M. Tomlinson.....	Tennessee
G. F. Haynes.....	Mississippi	Bart N. White.....	California
Norman Henry.....	Mississippi		

UNIVERSITY OF CALIFORNIA, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the University of California were held May 19, 1904, at San Francisco.

The degree of D.D.S. was conferred on the following graduates:

Julia Bacigalupi	Clarence John Frederick	Herbert Turbitt Moore, A.B.
Carlo Edwin Balzarini	Louis Graham	William Charles Olwell
Guy Bennett	Louis Charles Heller	Louis Cecile Pegot
Albert Brown	Edward J. Howard	Carlton Eugene Rhodes
Timothy Bartholomew Callahan	Arthur Gordon Kelly	Frank Erwin Rodolph
Joseph Phillip Clarke	Thomas Robert Edgar Keys	Frank Rohner
Lewis Thornton Corwin	Albert E. Kline	Ethan Wait Scott, M.D.
William Wirt Craycroft	Charles Cameron Lane	Minot Everson Scott
Seymour Coares Davis	Iltred William Letcher	Frank Shanasy
Albert Maurice Dinsmore	Martin John Lewis	William Theophilus Shanasy
Charles Valentine Doll	George Thomas McDaniel	John Christopher Smith
Fred Loveland Dungan	Caleb Wells McKinney	Arthur Wilson Sobey
Frederick William Elworthy	George Verrill McLaughlin	Paul Abio Trullinger
Elmer Ellsworth Evans	John Edward Middleton	William McKinley Walton
Robert Edward Farley	Geo. E. Minahen	John Young Warren

GEORGETOWN UNIVERSITY, DENTAL DEPARTMENT.

THE fifty-fifth annual commencement exercises of the Dental Department of Georgetown University were held at Gaston Hall, Georgetown College, Washington, D. C., Tuesday, June 7, 1904.

The valedictory was delivered by John J. Griffin, D.D.S., and the address to the graduates by Prof. George Tully Vaughan.

The degree of D.D.S. was conferred by Rev. Jerome Daugherty, S.J., on the following graduates:

Howard Alansen Bradley.....	Illinois	John J. Griffin.....	Massachusetts
Joseph Perl Conigisky.....	Illinois	Francis R. Mulhearn...	Rhode Island
George Robert Connors.....	Rhode Island	Frank S. McConnell....	District of Columbia
John Edward Dorman.....	Iowa	Ralston Byrnes Regan..	Mississippi

NEW YORK COLLEGE OF DENTISTRY.

THE thirty-eighth annual commencement exercises of the New York College of Dentistry were held at Carnegie Hall, New York city, Monday, May 16, 1904.

The valedictory was delivered by Joseph R. Armstrong, D.D.S., and the address to the graduates by George R. Van De Water, D.D.

The degree of D.D.S. was conferred by Rev. George Alexander, D.D., on the following graduates:

Otto Acker	George Ginsberg	Andrew Henry Oeder
Joseph Robert Armstrong	Adam Glutting, Jr.	Edward Paymer
Andrew Jackson Asch	Alfred David Goldstein	Nathaniel Lazarus Polinger
Arthur Waldemar Bark	Abraham H. Goodman, Ph.G.	Sydney Carton Rhodes
Eugene Samuel Baum	Arthur Victor Greenstein	Adolph Ritt
Simon Berlin	Charles Grosch	Harry Salomon, B.A.
Isidore Berowicz, Ph.G.	Charles Joseph Haas	William Irving Sax
Edward Peter Betzig	Henry Yetta Halley	Samuel Sencer
Edward William Burckhardt	Albert Harris	Emil Singer
Herman Bennett Cahen	Frank James Holmes	Warren Jay Smadbeck
Abraham Bernard Cohen	Bruno Waldo Kirschner	Henry Spenadel
Moritz Cohn	Herbert John Kocher	Louis Startz
Theophile Conzelman	Alfred Leitner Kohn	Fritz Julius Swanson
James Joseph Curtin	Montgomery de Forest La Roche	Robert Irving Teichman
Samuel Eisner	Maurice Wilfred Lubitz	Heman Ermo Tompkins
Walter Frederick Engel, M.D.	Morris Mencher	Walter Scott Torrance
Michael Epstein	Irving Underhill Miller	William Bell Tyrrell
John Peter Frank	Louis Neuirth	Edwin Lew Walker
Jacob Albert Gam	Frank Wickham Norris	Jerome Milton Woodlee
Samuel Max Getzoff	Edward Joseph O'Byrne	Joseph Wortmann

UNIVERSITY COLLEGE OF MEDICINE, DEPARTMENT OF DENTISTRY.

THE annual commencement exercises of the Dental Department of the University College of Medicine were held at the New Academy of Music, Richmond, Va., on Thursday, May 12, 1904.

An address was delivered by Rev. Henry L. Smith, Ph.D.

The degree of D.D.S. was conferred on the following graduates:

C. Harry Banks.....	North Carolina	Marvin St. Clair.....	Virginia
Alfred P. Curtis.....	Virginia	Harry LeCato Smith.....	Virginia
Harry Andrew Duncan.....	West Virginia	Joseph Hoyt Smith.....	New York
Moylan C. Field.....	Virginia	William Elwood Snipes.....	North Carolina
Marion Morgan Harris.....	North Carolina	John Louis Spitzer.....	Virginia
James Claude Johnson.....	North Carolina	Reston M. Squires.....	North Carolina
Themistocles W. Laguna.....	Porto Rico	Romulus William Stephens.....	North Carolina
Chas. Elmer Nicholas.....	Virginia		

COLORADO COLLEGE OF DENTAL SURGERY.

AT the annual commencement exercises of the Colorado College of Dental Surgery (Dental Department of the University of Denver) the degree of D.D.S. was conferred on the following graduates:

Frederick S. Barber	Benjamin F. Elliot	Jesse Cromwell King
Fred Drew Boyce	Harvey P. Greedy	Ira Onis McCarty
Harry F. Clingan	Nicholas J. Grosjean	Jasper Loren McDonald
Claude W. Craine	Frederick C. Hannahan	Edward A. Owen
Fred. A. de Lespinasse	Fred. G. Hunt	Lyndon P. Spann
Herbert Charles Dolph	William P. Jack	James A. Webb
Dana J. Edmunds	William A. Kerrison	

PITTSBURG DENTAL COLLEGE.

THE eighth annual commencement exercises of the Pittsburg Dental College (Dental Department of Western University of Pennsylvania) were held at Carnegie Music Hall, Pittsburg, Pa., on Friday, April 29, 1904.

Addresses were delivered by Walter H. Fundenberg, D.D.S., dean, and Mr. James F. Burke.

The degree of D.D.S. was conferred by Prof. Dan'l Carhart on the following graduates:

Claude D. Anderson	Ralph C. King	Charles Warren O'Hara
Clarence L. Beatty	Gotlieb Klicka	Isabelle B. Patton
Robert W. Beatty	Herman E. Krumpe	I. Robert Pershing
Emil F. Bell	Harry William Lehner	Arthur Gordon Ramsay
Phillip Bertram Benz	Clyde Arthur Livingston	George S. Robinson
Robert S. Brinton	John Volney McAlpin	Ira Blaine Schoaf
James Burnes Crooks	John Morris McCue	Edward C. Shoemaker
Benjamin K. Crow	Raymond L. McKee	Reynolds M. Sleppy
William R. Donaldson	Patrick V. McParland	Edwin Irving Smalley
J. Ross Garman	Frank Howard Magill	Charles Spurgeon Smith
H. Tyson Hartley	Earl Garard Miller	Earle Haslett Steen
Willington Q. Humbert	George V. Miller	William Playford Taylor
Oscar Small Kelly	J. Waldo Newmeyer	Harry Clyde Werts

MEDICO-CHIRURGICAL COLLEGE, DEPARTMENT OF DENTISTRY.

THE annual commencement exercises of the Dental Department of the Medico-Chirurgical College were held at the Academy of Music, Philadelphia, May 28, 1904.

The doctorate address was delivered by Joseph Swain, LL.D., president of Swarthmore College.

The degree of D.D.S. was conferred by Hon. Walter T. Merrick, vice-president of the Board of Trustees, on the following graduates:

Arthur Adams	John H. Hart	Joseph A. Moran
Joseph B. Arrowsmith	Frank J. Hawley	John A. Orwig
Garnet C. Cowan	William Henderson	Russell Rudolph
David T. Davies	Ben Ira Herr	Ira H. Spangler
Samuel Freeman	William Hoppman	Frederick Lewis Wallace
George Howard Grim	Kenneth Gray Lenhart	Isaac H. Whyte
David E. Hahn	Arthur T. Mackay	R. McIver Wilbur

UNIVERSITY OF MINNESOTA.

THE thirty-second annual commencement exercises of the Dental Department of the University of Minnesota were held at the Armory, Minneapolis, June 2, 1904.

An address was delivered by Thomas Wilson, Esq.

The degree of D.D.S. was conferred by Cyrus Northrop, LL.D., president of the university, on the following graduates:

Paul Wood Barney.....	Minnesota	Duncan Adrian McRae.....	Minnesota
Charles Ulysses Bell.....	Minnesota	Edwin William George Mihleis....	Wisconsin
David William Bennett.....	Minnesota	George Alfred Montelius.....	Minnesota
Theodore Olaf Braafladt.....	Minnesota	Albert Carlos Nelson.....	Minnesota
Arthur Henry Cox.....	Minnesota	Albert Alonzo Reed.....	Iowa
Walter Cornwell Cullum.....	Minnesota	Arthur Nelson Rice.....	Minnesota
Jay Monroe Freeburg.....	Iowa	Don DuVello Rider.....	Minnesota
Robert O. Green.....	Minnesota	Joseph August Schacht.....	Minnesota
William Alexander Grey.....	Wisconsin	Guy Benjamin Steadman.....	Minnesota
Leonard James Johnson.....	Minnesota	William Henry Strong.....	Minnesota
William Joseph Leffek.....	North Dakota	Walmer Turner Sture.....	Minnesota
Axel O. Lillehei.....	Minnesota	Carl August Swenson.....	Wisconsin

UNIVERSITY OF ILLINOIS, SCHOOL OF DENTISTRY.

THE third annual commencement exercises of the School of Dentistry, University of Illinois, were held at Steinway Hall, Chicago, Ill., on Thursday, May 5, 1904.

Addresses were delivered by Mr. George R. Loynd, Albert E. Converse, D.D.S., and A. F. Nightingale, A.M., LL.D.

The degree of D.D.S. was conferred by Thomas J. Burrill, Ph.D., LL.D., on the following graduates:

Charles Eugene Abstein
Elisha Melvin Arnold
Eric Beringer
William L. Berryman
George C. Brady
Lorace O. Catterson
Israel Cohn
Albert Edward Converse
Vernon Penfield Cooley
Chester Coleman Dobbs
Herbert Allen Dickinson
John Eckford
Edmund Richard Fitzgerald
Aaron C. Fogle
Hedwig Freyer
Edward Morrow Glenn
William Albert Gorny
Frank Riley Granger
Woodie Clay Hobbs

John Holmes
Lewis Warren Hopkins
Herman Harry Hubbard
Thomas John Ireland
Charles Thomas Jacobs
George Arthur Jones
Edward Kenny, Jr.
Henry Cooley Lee
Albert Bruno Lichtenberg
Charles M. Loescher
John Carlton Longwell
George Reuben Loynd
George John Lyon
Ivor McCormick
Oscar Fitzalen McMaster
William Henry McWilliams
John Charles Mackinson
William Daniel Mahoney
Franklin Benjamin Moore

Joseph Lawrence Murray
George Albert Ostermeier
Peter C. B. Peterson
Elmer Hugh Ramsey
Evangeline R. Richter
William Robert Rodenhauser
Elisabeth Louise Schultz
Charles Byron Sharp
Oskar Emil Sommerfield
Louis Aurora Stout
Earl Orson Vahue
Fred Wilson Van Voorhis
Ernest Wycliffe Vercoe
Richard M. Walsh
John D. Welch
Samuel Scott Wells
Charles Fred. Wertzler
Frederick Ambrose Whitbeck
George Henry Wilson

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MAY 1904.

May 3.

No. 758,741, to HIRAM E. DUNN. Dental lamp.
No. 758,750, to OLIVER C. and JNO. R. HALDEMAN. Artificial denture.
No. 759,152, to GEORGE L. BENNETT. Inhaler.
No. 759,189, to L. T. PARSONS. Dental or surgical chair.

May 10.

No. 759,369, to AUGUST G. V. HARCOURT. Apparatus for administering anesthetics.
No. 759,490, to JOHN A. YATES. Tooth-brush.
No. 759,668, to CHARLES J. CARLSEN. Pliers.

May 17.

No. 759,909, to RICHARD M. PELTON. Electrical furnace.
No. 760,047, to JAMES H. WILSON. Tooth-brush.
No. 760,050, to GEORGE B. WORTMAN. Dental swaging machine.

No. 760,099, to REUBEN C. BROPHY. Combined blowpipe and burner.

No. 760,295, to WILLIS E. ALLEN. Process of obtaining correct dental impressions.

No. 760,397, to EDWARD C. KIRK. Dentifrice.

May 24.

No. 760,800, to FRANK R. NICE. Rubber dam holder and cutter.

No. 760,943, to EDWIN P. WRIGHT. Dental manikin.

May 31.

No. 761,155, to LUCIEN EILERTSEN. Process of making dental plates.

No. 761,193, to ADOLPH F. BLANCHARD. Tooth-brush.

No. 761,273, to ROBERT WALKER. Dental mouth-mirror.

THE DENTAL COSMOS.

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AUGUST 1904.

No. 8.

ORIGINAL COMMUNICATIONS.

EXTIRPATION OF THE PULP UNDER PRESSURE ANESTHESIA, INCLUDING A STUDY OF AFTER-RESULTS.

By RODRIGUES OTTOLENGUI, M.D.S., New York, N. Y.

(Read before the Northern Ohio Dental Association, at its annual meeting at Cleveland, June 7, 1904.)

AS an excuse for the presentation of this paper, let me state that it has seemed to me noteworthy that the advocates of pulp-removal under pressure anesthesia have counted their cases as "successful" when anesthesia has been accomplished and painless removal of the pulp has thus been made possible. Unpleasant after-results—to use a mild term—have apparently not been counted at all, or at least they have not been recounted. I have met with so many that it has seemed to me a theme worthy of serious study.

Again, the advocates of the method, when asked to explain failure—by which I mean failure to produce insensibility—have replied, "You have not properly applied the method." This is far from satisfactory to the questioner who has met failure of this character. Neither is it a scientific response to a perfectly legitimate query, nor is it a true statement, for there are cases in which no method of applying pressure anesthesia will cause insensibility, as we shall see.

Without further preliminary, let me approach the subject directly, dealing with it from two aspects; first, the application of pressure anesthesia for painless pulp-removal; second, a consideration of after-results.

From accurate histories of all the cases that have passed through my hands during the past year, I classify the conditions prevailing at the time of resorting to pulp-removal under four distinct headings, each with a prognosis and series of resulting phenomena constant to its class.

CLASS I: *Freshly exposed pulp otherwise in a healthy condition.*

The prognosis in these cases is favorable throughout. Anesthesia should be perfect after a three-minute application. Hemorrhage is inconsiderable and is readily controlled. Success is almost absolutely certain in deciduous teeth.

Exceptions: Anemic patients; persons who have an antipathetic idiosyncrasy against cocain; cavities so situated that oral fluids cannot be positively excluded.

EXAMPLES FROM PRACTICE: CASE I.

Patient a woman aged forty. An upper first molar aching badly. Applied rubber dam, removed leathery decay causing fresh exposure of pulp with free bleeding. Pressure anesthesia attempted, using anhydrous crystals of cocain freshly dissolved in adrenalin—practically a saturated solution. Application of pressure three minutes; pulp removed entire from three canals, absolutely painlessly; hemorrhage slight. Dressed with antiseptic, which on removal two days later showed no evidence of stains from secondary hemorrhage. Canals filled. Subsequent history, perfect comfort.

CASE II.

The second temporary molar of a child aged seven. Rubber dam applied. Pressure anesthesia for three minutes; pulp removed entire, and painlessly. Hemorrhage slight. No after-trouble.

Comment. Of cases like case I, I have had a great number, success being as good in multi-rooted teeth as in single-rooted teeth. Still, I have also had exceptions as will be cited.

Of cases like case II, I have had only five, but they have been all so utterly satisfactory that I do not hesitate to say that pressure anesthesia solves the problem of an aching exposed pulp in a temporary tooth where the tooth can be isolated with the dam. Where the gum tissue between the teeth is hypersensitive, as it commonly is, one application of the cocain is made prior to applying the dam, by which means the gum tissue is rendered insensible. In a sixth case where the intractability of the young patient made it unwise if not impossible to apply the dam, equally good success was attained, a large piece of unvulcanized rubber being utilized and the pressure applied with the ball of the thumb, thus in a measure insuring the restriction of the drug to the cavity.

CASE III.

Patient a young woman aged twenty; anemic. Lower second bicuspid; distal

cavity. Pulp freshly exposed and apparently otherwise healthy. Application as before mentioned, and painless removal accomplished. Hemorrhage profuse, but seemingly controlled after five minutes. Dismissed with antiseptic dressing and cavity sealed. Patient returned in four hours suffering intensely. Removal of the dressing was followed by profuse secondary hemorrhage, pain subsiding with the release of the blood. Bleeding was controlled after fifteen minutes, and the canal dressed with absorbent cotton, dry, covered with sealing material.

The patient was seen next day, and reported no discomfort. The dressing was removed and found saturated with blood.

This and similar cases establish the fact that considerable secondary hemorrhage may follow pulp-removal under pressure anesthesia, and that it is a constant danger which should not be overlooked. It also establishes the value of a dry dressing, one that is not steeped in an oil. The dry dressing readily absorbs all blood and may inhibit the formation of a clot beyond the apex by drawing the blood within the canal. I look upon this as a valuable clinical procedure. The dressing may be rendered aseptic with some antiseptic powder, or by placing a second bit of cotton slightly moistened with an antiseptic between the canal dressing and the outer seal, since it is the ingress of infectious material through the oral cavity that we are endeavoring to prevent.

CASE IV.

Patient a man aged thirty-two. Lower third molar; occlusal cavity; pulp exposed, but apparently not otherwise affected. After isolation with rubber dam, six applications of cocain were made, each of three minutes' duration. Arsenic was then used, and was repeated at the second sitting before the pulp could be removed. No evidences of calcification.

This patient is one in whom there is undoubtedly an idiosyncratic antipathy to cocain. Some years ago, in treating the first molar on the same side I essayed cocain cataphorically. The current was sustained for eighteen minutes without

anesthetic effect, but the patient then evinced a numbness almost amounting to temporary paralysis of the side of the neck and arm, which curiously enough endured for exactly eighteen minutes. I record this case as of interest, but while I have used this experience as a basis for one of the exceptions under my rule for this class, I must also state that it is a unique case; but I deem it worthy of mention because idiosyncrasies against special drugs are common in the experience of physicians—some individuals, for example, tolerating tremendous doses of morphin, while others exhibit toxic symptoms if only minute doses are administered.

CASE V.

This case is introduced as an example of the exception noted—viz, where oral fluids cannot be positively excluded. Cavity in lower third molar of a man thirty years of age. It involved the greater portion of the buccal wall and part of the distal, so that it was almost impossible to apply the dam, there being more or less leakage under the clamp, which was but insecurely held. Cocain pressure failed, probably because of this leakage, and arsenic was applied. The pulp was removed at the second sitting, but infection supervened, and the difficulty of completely sterilizing the canals made it finally necessary to extract.

CLASS II: *Pulps aching, in teeth that are already filled, and found to be exposed or nearly so upon removal of filling.*

The conditions usually prevailing are sufficiently unfavorable to render prognosis doubtful, and more than ordinary precautions advisable.

This sort of teeth are here placed in a class apart because certain dangers are present the recognition of which at the outset tends to render the treatment more scientifically exact and the outcome more certain to be favorable. A study of the class shows that the filling in the tooth must necessarily have been intended as either permanent or probational. If

the former, it is probably of gold or amalgam; if the latter, usually it is zinc oxyphosphate. If a metallic filling be present the history of the case will reveal whether the pulp-affection is due to failure on the part of the dentist to remove all of the carious material—in which case caries will have been slowly progressive; or whether, where for example the filling has long been in place, the pulp has been injured since the filling. But in either case we have a morbid tissue to deal with. This is more certain to be true where the filling is probational in character. If the previous attendant has filled with oxyphosphate, it is evidence that the condition of the pulp caused him to doubt the advisability of using a metallic filling. In any case, then, a pulp aching and covered by a filling may be considered as a morbid tissue, and prognosis will depend upon the conditions found upon removal of the filling.

If the filling was of a permanent character and had long been in place, it may be premised with considerable certainty that the too close proximity of the metal or some outward exciting agent has caused a deposition of calcific material in the pulp, and this will place the case under Class III, to be described hereafter. If the pulp be suffering from a traumatism, it is possible that a ruptured vessel has brought about the pain, and prognosis should be as in Class I, except that there will be more likelihood of hemorrhagic disturbances. Where the filling was probational in character, and had been in place but a few weeks, the probability is that caries has been progressive until pulp-irritation has ensued.

In all these cases it is important to carefully note the first exudation from the pulp as it is uncovered. If a drop of pus should escape, it shows that infection is already present. This being true, for reasons that will later be explained, pressure anesthesia should never be attempted at the first sitting; instead, a dressing which will be both sedative and antiseptic in character should be applied. Ceylon cinnamon oil may be relied on in such conditions. Usually the escape of pus and the slight hemorrhage alleviate

the suffering anyway, and the main purpose of treating antiseptically is to avoid danger of forcing septic material through the apex, thus infecting the tissues in that region. Where there is no pus present, and no calcification, prognosis should be favorable throughout. As an evidence of the need of caution in these cases, and in support of my advice to treat antiseptically for at least twenty-four hours prior to using pressure anesthesia, I will cite the following cases.

CASE VI.

Patient (a woman aged about thirty) presented with aching lower second bicuspid. Tooth filled with oxyphosphate, which had been in place for two months, during all of which time the patient declared that the tooth had "grumbled." As the last bit of the oxyphosphate was forced away from the pulpal wall the tiniest drop of pus escaped and was quickly washed away by the free hemorrhage which ensued. Not recognizing the clinical value of the presence of pus, and therefore not considering it essential to use a sterilizing agent in a cavity from which a tight filling had just been removed, I proceeded directly with my cocain application, which was entirely successful, the pulp being painlessly removed entire after three minutes. A profuse hemorrhage ensued which was finally controlled with hydrogen dioxid, and a dressing of cinnamon oil was placed in the canal.

The patient was dismissed for two days, but she returned next day reporting pain and tenderness. The dressing was renewed, slight secondary hemorrhage ensuing, and a new dressing was placed. Twenty-four hours later I was called by the patient on the telephone; she reported increasing pain. I recommended $\frac{1}{8}$ grain of morphin and a visit to me on the next day. The morphin acted well but the symptoms were progressive, so that on the next afternoon I was obliged to visit the patient at her house and lance a well-developed abscess.

This sort of case will be discussed more fully in the latter part of this paper;

I will merely say here that in my opinion in this case the application of pressure anesthesia carried along the blood tracts of the pulp septic germs, forcing them beyond the apex, where upon the removal of the pulp tissue they found pabulum in the secondary hemorrhage, which afforded an environment favorable to bacterial propagation. I expect to be asked why I did not use formalin, as has been recommended, prior to resorting to the cocain. I did not at that time deem it requisite, but on this point the following case will throw some light.

CASE VII.

Patient a young woman aged about twenty. A lower second molar had been filled with oxyphosphate for about three years. This filling had been undermined by caries, and the pulp was found to be exposed. The carious matter was removed and a portion of the pulp was easily cut away, showing that it had become affected. Later, however, a painful area was reached and cocain became necessary. Formalin was used freely in the cavity and on the pulp for full five minutes, after which the cocain was applied and the pulps from both canals painlessly removed. Profuse hemorrhage followed, which was allowed to drain thoroughly until it apparently ceased, after which the canals were cleansed and dried and an antiseptic dressing applied.

I confidently expected a happy outcome, yet this tooth persistently continued "uncomfortable" for several days. Believing that perhaps I would get better results by filling the roots, I thoroughly sterilized the canals by the Schrier method, as is my invariable custom, and filled the canals. By the next day the tooth was so sore that I was obliged to admit the patient to a sitting out of turn, and was forced to remove the root-fillings. The canals were again sterilized and dressed with an ethereal solution of iodoform, my usual salvation in such emergencies, and it was three weeks before I dared to fill the canals a second time. There was no abscess in the true sense of the word, but my explanation is

that, as before, septic germs were carried beyond the apex and an infected blood-clot was present, the tooth giving trouble until this had become absorbed. Apparently the application of formalin (forty per cent.) for five minutes did not inhibit the germs—probably present in the pulp itself.

CLASS III: *Calcific material present.*

Full anesthesia by pressure is rarely obtainable. This is true in all varieties of calcifications, whether it be nodules or deposition of secondary dentin. Hemorrhage seems to be less probable and is usually more easily controlled, yet in one or two cases I have noted profuse hemorrhage, both primary and secondary.

CASE VIII.

Patient a man. Central incisor, worn down by attrition. Desiring to apply a crown, I drilled as far as I could toward the pulp, and the sensitiveness becoming unbearable I resorted to cocain. Seven applications of three minutes each proved absolutely ineffectual. I then applied arsenic, and at the next sitting was able to drill through the secondary dentin, fully exposing the pulp, but the sensitiveness then again obtained. It is of interest to record that another attempt with cocain was unsuccessful, and this has been my invariable experience after arsenic has once been applied.* A second arsenical application therefore became necessary.

CASE IX.

Patient a woman aged about forty-five. Lower canine; pulp exposed under ordinary caries, three applications of cocain having failed to relieve the sensitiveness. Diagnosed pulp-stones, and despite the pain burred away the upper portion of the pulp. Another application of cocain enabled me to remove the pulp, but with considerable pain to the patient. This

specimen was immediately examined under the microscope; the upper part was found filled with pulp-stones, one being of great magnitude. Some evidences of cocain were found throughout the uncalcified part of the pulp, which accounts for the partial anesthesia. The fact that cocain may be detected with the microscope will receive fuller discussion later in this paper.

CLASS IV.

This includes *so-called sound teeth*, in pyorrheal mouths, where pulp-removal is resorted to as a measure of treatment. Three obstacles to success are to be encountered. First, there is great probability of pulp-calcification; second, hemorrhage is a common sequence; and third and most important, the socket being already in an infected condition, apical abscess is a not improbable sequence.

CASE X.

The patient in this case was a man in middle life with considerable pyorrhea persisting in spite of treatment. An upper molar being peculiarly sensitive, pulp-removal was decided on. Pressure anesthesia proved perfectly successful so far as painless removal was concerned, there being no calcification present. Hemorrhage was profuse and not easily controlled. In spite of antiseptic precautions, apical abscess ensued, causing considerable disturbance until a sinus connecting with the pyorrheal pocket was established.

CASE XI.

Patient, a man of forty-five, presenting an upper molar having palatal root badly denuded and extremely sensitive—practically amounting to continuous pain. Slight pyorrheal conditions present in the mouth and about this particular tooth. The roots were cleansed as thoroughly as possible prior to treatment, and the pulp was removed under cocain anesthesia—which, however, was far from painless, there being pulp-nodules throughout all three branches

* [Since reading this paper I have had a complete success with a pulp which had resisted a twenty-four hour application of arsenic. Consequently this statement must be modified.—R. O.]

of the pulp, and separate applications of cocain were needed for each root. In this case (as stated under Class III) there was very little hemorrhage, and after one antiseptic dressing and thorough root-sterilization the three canals were filled. Within a week an abscess formed over the anterior buccal root, and root-amputation was required, after which a perfect recovery was made.

The deductions to be made from the above would seem to be, either that I have been most unskilful, or else that pulp-removal under pressure anesthesia is a more complex operation than would be imagined by one without personal experience and who would judge solely by the recent contributions to current literature. In the second part of my paper, which I now approach, I shall endeavor to account to some extent for the troubles which I have experienced.

To those who have not found pressure anesthesia all that has been promised—and I have little doubt that I am not alone in my adverse experiences—let me call attention to one important fact. We all have for years been removing pulps after an arsenical application. In resorting to the cocain method I think we have overlooked an important clinical difference in the two procedures. A pulp dressed with arsenic reaches us in an altered condition too well understood for it to be needful here to discuss it; removal under cocain is practically an anesthetic surgical operation, and we should remember that all phenomena which may occur elsewhere in the body are equally to be combated in this region, except of course such as may be purely local in character.

The first consideration is the rupture of the bloodvessels. Without stopping to discuss the exact distribution of these vessels, whether from a single vessel entering at the foramen or whether from one or more which traverse or anastomose with those of the pericementum, suffice it to state what we all admit, that these vessels do pass out through the foramen. The removal of the pulp under cocain anesthesia presents the common phe-

nomenon of a bloodless tissue, followed by an apparent copious flow of blood. This, however, is not a true hemorrhage. The vessels being torn asunder and the pulp forcibly drawn out, the blood of the pulp itself is squeezed out and remains in the canal. This blood is removed with tampons of absorbent cotton or bibulous paper, and the canal further cleansed with the syringe. If at this period the canal is seen to slowly fill again with blood, what I would term a true hemorrhage is present; a torn vessel is bleeding.

Under exactly similar conditions anywhere else in the body, what would the surgeon do? If possible he would ligate the stump of the bleeder, or if very small he might twist it. Neither procedure can be followed in this situation. The dentist usually undertakes to control this hemorrhage with some hemostatic. Is this good surgery? Can you imagine a surgeon doing a major operation (involving bony tissue) closing his wound and leaving within it a vessel which has bled and which has been stopped solely by the application of a drug? I think the surgeon would feel safer to not fully close his wound but to establish drainage in some fashion. Why? Because he realizes that blood that is stanchd in this manner (as in ordinary nosebleed, for example, stopped by plugging with a styptic) may start to flow again. The force with which the blood flows may be sufficient to remove the clot formed at the torn end of the vessel, in which case the bleeding continues until another clot is formed. This is known as a secondary hemorrhage—and I beg to assure my hearers that it is a never-to-be-forgotten possibility where a pulp is removed alive, whether under cocain or any other anesthetic.

Wherein lies the danger from this secondary hemorrhage? A clot is formed. Now, this clot must be cared for. If it escape infection it will be absorbed, but even without true infection we may have distension of the parts causing pain, and we may have a true inflammation. Infection may reach this clot in several ways. In mouths affected by pyorrhea,

especially where there is a pocket on the particular tooth under treatment, it is conceivable that the pus germs may readily migrate through the slight barrier of bone between the bottom of the pyorrhea pocket and the region about the apex where the blood-clot lies. Again, we are told that there may be germs within the blood tracts which do no harm until emptied out upon a favorable medium, when propagation and consequent pus formation is a necessary sequence. The germs then may be in the clot itself, and as soon as the blood leaves the vessel these germs are freed from the inhibiting action of the leucocytes. Lastly, and this is a point on which I make great stress, the germs may have been in the cavity and may have been carried into and through the pulp with the cocain solution; and this brings me to my promised explanation of the statement that the cocain could be detected with the microscope.

I relate the following with some hesitation, because I am not positively assured that I am right, not having had sufficient material with which to make my belief assured conviction and beyond dispute. However, I will give my experience, reserving the right to withdraw my present views after further study of the facts.

For the past two months it has been my habit to examine all pulps removed under cocain with the microscope. In the first specimen so examined it seemed to me that I could plainly see the crystals of cocain, and they seemed to be deposited along the blood tracts. If this were true, it became at once manifest that our anesthesia is not merely a physiological result of mere superficial contact with the cocain, but that the cocain in solution is actually taken into the bloodvessels of the pulp itself. By allowing the pulp to dry, the solvent which carried the cocain would evaporate, and the crystals would be deposited. I was eager to verify this proposition and promptly examined the next pulp removed. In its perfectly fresh condition no appearance of the cocain could be seen, but after half an hour they were plainly visible, again fol-

lowing the blood tracts to the very apex. After accumulating four or five specimens, in all of which these crystalline bodies could be discerned, I carried the experiment a step further, and undertook to re-form the solution within the pulp after it had dried.

To do this I took one of the dried specimens and soaked it in adrenalin for ten minutes. The result was not entirely satisfactory; the whole appearance of the tissue was altered, and while the crystals seemed less apparent, still I could not decide that they had been redissolved. Next I placed a drop of cocain dissolved in adrenalin on a slide and allowed the solution to evaporate. This left a coating of cocain on the slide, and these crystals so far as I am a judge have the same general appearance as those seen in the pulps. A final decision, however, cannot be reached without the aid of the polariscope. Finally I examined pulps devitalized with arsenic, and these do not show any such crystalline masses.

In the particular specimen to which previous allusion was made, the one in which pulp-nodules were present, I could note the cocain in characteristic masses about the nodules, but beyond, throughout the uncalcified portion of the pulp, the appearance was quite different. Here, if the cocain were present at all, it seemed rather to have passed down between the canal walls and the pulp, forming a thin coating over the entire pulp, so that the whole mass has the appearance of an icicle. This specimen fortunately I still have; all the others, however, I regret to say were ruined by my mounting them in balsam. For some reason the crystals have practically disappeared after this mounting. I will request time, therefore, for further study of this rather interesting phase of the subject.

It is because of my present belief that the cocain solution actually enters the pulp, following the blood tracts, that I strongly advise thorough cavity sterilization, for certainly any germs present may be taken up with the solution and carried into and even through the pulp to the tissues about the apex. I am not as yet sure that we have any reliable cavity

sterilization which can be considered effectual within the few minutes usually allotted to the work. For this reason, in the presence of actual pulp-suppurative I should recommend sealing a germicide within the cavity for at least twenty-four hours, this to be followed by the further sterilization of the cavity after applying the dam. It might be that it would be safer to add a germicide to our cocain solution. Certainly I have had very satisfactory results by using Borine to make my solutions. This preparation contains formaldehyd besides other antiseptics. By this means, perhaps, even though some infectious material may become mixed with the solution its deleterious influence may be inhibited.

Following the method of the surgeon I recommend a dry dressing in the canal proper, which in turn may be covered with a little ball of cotton carrying an antiseptic. I think I have seen good results from this method of drainage, for on several occasions where I had not

really expected a secondary hemorrhage I have found my dressing literally saturated with blood, and in these cases the teeth have remained comfortable.

Lest it be imagined from the foregoing that all my experiences with cocain pressure have been unsatisfying and troublesome, and that therefore it be thought that I am contending against the method, I beg to state that the cases reported above are rather exceptional. I do believe, however, that they are of such a character as to be constant under like circumstances; that is to say, that the same teeth or the same sort of teeth treated in the same manner will be followed by the same sequelæ. It is for this reason that I have thought it worth while to record and if possible classify some of my failures. I say "some," for while the majority of my pulp-treatments by this method have been entirely successful, it is also true that I have not given a full list of all the troublesome cases which I have had.

THE ADVANCE OF PORCELAIN RESTORATION IN GERMANY.

By E. N. JENKINS, D.D.S., Dresden, Germany.

(Read before the New York State Dental Society, at its annual meeting, Albany, May 13, 1904.)

THERE is probably no country where the general use of porcelain for the restoration of decayed and fractured teeth has attained such proportions as it has in Germany. During the past seven years there has been a constantly increasing interest in this important work, until now practically all German dentists use porcelain to some extent.

The question naturally arises, Why should these operations have become, within so short a time, so popular? To answer this question correctly, one should take into consideration the character of

German education and the influence of the German temperament. Ever since dentistry has become a part of the university curriculum and been practically taught as a specialty of medicine, the difference between the educated Zahnarzt and him who practices dentistry as a mechanical art has become more strongly marked. Some things, however, they have in common. Both the Zahnarzt and the Zahnkünstler, far apart as their intellectual equipment often is, have a logical habit of thought and a pronounced esthetic temperament. The former may

be largely the result of the splendid order and system which characterizes German educational methods; the latter has its roots in something which existed long before educational systems had been evolved and when the ancestors of the modern Germans were unlettered nomads.

GOLD USED AS IT WERE UNDER PROTEST.

To the German mind the making of a gold filling must always seem an illogical procedure. The preparation of a cavity where the retention of weak walls must often seem a necessity, and where, in obscure positions, the complete removal of decay is occasionally impracticable; the frequent necessity of building up an important structure largely dependent upon fitful and precarious points of attachment, obtained by sinking retaining-pits in sound dentin; the strain upon patient and operator in laboriously packing the filling in small pieces, each one of which must be elaborately pressed and hammered to obtain the desired solidity; the final horror of finishing and polishing, when both patient and operator are nervously exhausted; the misery of having an organ—saved, it is true, from the immediate recurrence of decay, but announcing its rescue afresh with every touch of heat or cold, and proclaiming its past unsoundness to every careless glance by its inharmonious color: these are considerations which always have influenced, and always will influence, German practice. Despite, however, the natural reluctance of the German dentist to use gold in the filling of teeth, he has learned to use this material with great dexterity, but he uses it always as it were under protest. It is therefore not surprising that he should have welcomed with enthusiasm a system and material which appealed to his logical faculty and his esthetic sense—for the methods of making a perfect porcelain restoration are clear and simple.

Those who have taught or written upon the use of gold in filling teeth know how difficult it is to reduce the subject to

anything like an exact formula; whereas, however great may be the care and skill necessary to produce a perfect result, the rules for making porcelain restorations are easily learned and are invariable. All compound cavities must be reduced to simple ones, so as to insure the withdrawal of the matrix unblemished. Weak walls which may not endure the strain of mastication, or the retention of which may be undesirable for any other reason, may be freely sacrificed. Plain access to every part of the cavity can and must be secured, permitting the unquestionable removal of all decay. Clearly defined and well-polished edges, at right angles or slightly shelving outward, are demanded and are always obtainable. Once having accepted the theory of cavity preparation, there is no confusion of mind as to how it should be carried out.

THE MATRIX.

Then, after the cavity has been perfectly prepared, the taking of the perfect matrix becomes simple. Usually the cavity is dried and covered with a film of vaselin, which is also well painted over the adjacent gum; then a piece of No. 30 gold foil, abundantly large, so as to give the shape of the tooth in the finished matrix, is carried first into the deepest part of the cavity, and afterward pressed and burnished until every fold and wrinkle has disappeared and a perfect impression of every part of the cavity and its edges has been secured. This can always be done, and there need never be any doubt in the mind of the accomplished operator regarding the accuracy of this part of the work—he *knows* when he has attained his object; and then, through delicate manipulation, the matrix is removed. Exceptionally patient and skilful men often obtain nearly the same accuracy with a platinum matrix, but in Germany the general practitioner almost invariably inquires, "Why should I give my patient and myself the annoyance of employing a refractory material when I can obtain a better result in an easier way?" There are also those who

find an advantage in taking an impression of the cavity and then working from a model, but it is not probable that so unnecessary a complication will ever generally supplant the simple and certain method of taking the matrix directly from the cavity.

The imbedding of the matrix in asbestos paste is another logical proceeding. There it lies immovable, showing the exact shape of the cavity and as much of the shape of the tooth as may be desired, easily handled and secure from all danger of distortion, capable of having its filling built up and contoured and made to flow to an exact edge with the utmost certainty, and making it wholly unnecessary to pause in mid career to readjust the matrix to the cavity.

One seldom finds a German dentist relying solely upon the roughening of the surface with hydrofluoric acid to cement the inlay into position, because he prefers two holds rather than one. He may use hydrofluoric acid, but more commonly he removes much of the glaze with a small sandpaper disk, and then makes slight grooves with a little diamond disk, also making small undercuts in the dentin, believing that he thus doubles the security of the filling. When, then, he has set his inlay in cement of the proper consistency, has held it in position until the cement has begun to crystallize, and kept

on the rubber dam until crystallization is reasonably completed, he is full of confidence that his work has succeeded; and it is illustrative of his sincere and honest character that, if he ever has a failure, he frankly attributes it to some error in manipulation rather than to any defect in the logic of the system.

There seems to be only one reason to question the indefinite extension of this system in Germany, and that is its expense. No man can afford to make the perfect porcelain restoration for the fee he receives for the same operation in gold, and very many German patients cannot afford even gold operations. There seems, however, no limit to the sacrifices which German patients will readily make when they are familiar with the advantages of porcelain restorations rather than submit to distressing and disfiguring operations in gold, and it is to this fact, and the certainty that experience will yet find methods of simplifying this work, that we must look to make its employment universal.

It is, therefore, not surprising that the Teuton should have welcomed with enthusiasm a system and material which appealed to his logical faculty and his esthetic sense—for the methods of making a perfect porcelain restoration are as clear and simple as the results are beautiful.

RECENT APPLICATIONS OF THE TRI-ULTRA-VIOLET OR X RAY TO DENTAL SURGERY.

By FRANCIS LE ROY SATTERLEE, Jr., A.M.,

DIRECTOR OF PHYSICAL AND X-RAY LABORATORIES, NEW YORK COLLEGE OF DENTISTRY.

(Read before the Connecticut State Dental Association, at Hartford, Conn., April 19, 1904.)

BEFORE proceeding with the demonstrations this evening, we will give a short time to the theory, history, and development of the Roentgen ray and its kindred radiations. I have therefore divided my subject into three headings, namely, *theory, apparatus, and applications.*

The early experiments with vacuum tubes proved but little of importance beyond the fact that any rarefied gas, when subjected to an electrical discharge, gave forth a peculiar light or phosphorescence. Air produced a pale violet glow, hydrogen a red, and carbon dioxide a steel coloration.

Sir William Crookes in 1878 constructed the first form of focus tube ever used. He experimented with the rectilinear rays within the vacuum bulb and by introducing a curved negative electrode, or cathode, succeeded in projecting these rays to a common point. Objects placed at the focus of these rays were heated to whiteness by the "bombardment" of the enormous quantity of projected molecules.

All such rays produced in a partial vacuum, when excited by an electrical discharge, were termed "cathode rays," from the fact that they originated from the negative terminal of the vacuum tube, and it was discovered that there was evidence of these rays outside of the vacuum tube, and that they even penetrated a thin sheet of aluminum. This was in 1883, twelve years before the discovery of the X rays.

Professor Weideman of Leipzig was the first to ascribe to these "cathode rays" the possibility that they were in reality light rays of extremely short

wave-length situated at the remote end of the regular light spectrum. This theory was gradually conceded by the physicists till at length the name cathode rays gave way to the ultra-violet and ultra-ultra-violet rays of the present day.

It remained for Prof. William Conrad Roentgen, after a long period of dormancy on the part of the experimenting scientists, to again startle the world with the announcement that he had discovered an entirely new ray differing from any of the cathode rays, inasmuch as his rays not only passed through a thin sheet of aluminum, but that they penetrated the human body, and many other opaque substances, and disclosed upon a screen coated with a layer of barium-platino-cyanid a perfect shadowgraph of the bones, or other intervening substances of different densities. This was in December 1895, and it was but a few months later that Dr. Roentgen found that the rays had an active influence on a photographic plate.

You may all recall with what wonder and surprise you looked upon the first radiographs printed in the newspapers in the winter of 1896. These rays at once became known as the "X rays," called so by their modest discoverer, who preferred to designate them by the algebraic unknown quantity than by his own name. X rays they have been called, and X rays they will remain, try as we like to dignify them with more accurate titles.

Dr. Roentgen, in a paper read before the Wurzburg Physico-Medical Society, described some of his experiments, and the facts that he deduced from them. Among other things he showed that the

rays had a penetrating power that was governed not by the thickness but by the density of the substance. He also formulated a theory that they were perhaps due to the longitudinal vibrations of the ether.

Since that time there have been many investigators in the field, the results of whose experiments have been published in every scientific journal all over the world, and it is unnecessary for me to follow up this evening, even if time permitted, the many hypotheses and conclusions brought forward regarding the exact nature and cause of the Roentgen radiations; suffice it to say that the old theory of Professor Weideman's in reference to the cathode rays was again brought into use, and the present classification of the Roentgen rays places them at a point in the spectrum below the ultra and bi-ultra-violet radiations.

We find at the very lower end of the spectrum the tri-ultra-violet or Roentgen rays, with an estimated wave length of 0.014 micron; above this come the bi-ultra-violet rays, of about 0.1 micron in length, consisting of those rays given off by such radio-active substances as radium, uranium salts, polonium, and in fact all the Becquerel rays. In this class also belong those of the cathode rays that will pass through glass. The next step is the ultra-violet rays of 0.21 micron in wave length, and the majority of the cathode rays that have not the power to penetrate even glass. Next come the violet, indigo, blue, green, yellow, orange, and red rays with the respective wave length. Still above these come the ultra and bi-ultra red or heat rays, and at the top, beyond a gap that we have not been able to classify at present, and as shown by the difference in wave length of the two classes of rays, come the tri-ultra-red or Hertzian rays now used for wireless telegraphy.

APPARATUS USED FOR THE PRODUCTION OF THE X RAYS AND BI-ULTRA-VIOLET RAYS.

Although the static machine is still used by some as the generating source of

electricity, we find that operators are now resorting to the induction coil for their electrical energy. We have here tonight for our demonstrations a coil that has been especially constructed for X-ray work. This coil, when used in connection with an interrupter of the electrolytic order, will generate X rays of a quality and intensity that have never before been equalled, thus not only giving a better radiograph, but diminishing the time of exposure to a minimum.

At many meetings of different dental societies where the X ray has been under discussion the subject of prices of outfits has come up, with the fact of the apparatus having been so costly as to be beyond the reach of the ordinary dental practitioner. For the benefit of those of you who have either partaken in these discussions or have read of them, I would like to say that in this coil we have a combination *par excellence*, and economy that would recommend it to those whose means were either great or small.

Besides a coil and interrupter we must have a suitable rheostat, a fluoroscope, and a supply of vacuum tubes, the last-named requisite being perhaps the most essential for good work—for unless the operator has a good tube his results are sure to be of a discouraging nature.

We will give a few minutes to the description of an X-ray vacuum tube. It consists of a bulb of glass with two elongations into which are introduced, respectively, a positive and a negative electrode. The tube is then exhausted of air to about the 1/1000 of an atmosphere. The tube is then connected to the coil terminals by means of two wires from its electrodes. The induced current of about 250,000 volts, and from 8 to 30 ampères, enters through the negative or cathode electrode, and in passing through the tube generates cathode rays. These rays are focused upon a point on the platinum anode, as the cathode is concaved, and are then reflected outward in all directions, since the anode is placed at an angle of forty-five degrees.

When the cathode rays strike the surface of the platinum anode, some of them are broken up into X rays, which are

then sent out in all directions from the anodic surface, producing a hemisphere of activity whose radii all point to a common center upon the positive electrode.

There are many kinds of tubes, but my time this evening being limited, and as I wish to get to the demonstrations and lantern slides which I know will be of more interest to you, I will confine myself to a few of the characteristics of X-ray tubes.

You all know that it is impossible to pass a current of electricity through a vacuum. This being so, it presents to higher the vacuum the harder it is for the current to pass through the tube.

It is also true that a current of electricity passing through a vacuum tube has a great tendency to raise that vacuum. This being so, it presents to us one of the greatest problems in X-ray work, and our only success has been with tubes having some mechanical contrivance to lower the vacuum.

APPLICATION OF THE ROENTGEN RAY AND ITS KINDRED RADIATIONS.

When the X rays first began to be used, physicians and other operators became much alarmed at what appeared to be an inflammation of the skin following a prolonged exposure to these rays. It was at first supposed that this dermatitis resembled a burn, and its cause was attributed to the electricity given off by the operating tube.

This theory was for some time believed to be correct, and from it the term "X-ray burn" originated, and it was not until Dr. Kienbock of Vienna had conducted a long series of experiments, details of which I will omit this evening, that the conclusion was reached that it was not the electricity but the X rays themselves that were the cause of all the mischief, and furthermore that those rays given off by a low-vacuum tube were more dangerous than those given off by a high-vacuum tube, although the latter gave off far more electricity than the former.

Many experiments have been made to

prevent this development of dermatitis, but with no results where the patient had been under the ray for a length of time. However, with the improved apparatus now in use, we rarely if ever hear of a case of burn, since the length of exposure has been reduced to a minimum. It takes us now but a minute and a few seconds to take a picture through the most difficult part of the body, while radiographs of the arms, feet, and teeth are made in a few seconds, where formerly twenty or thirty minutes were given. It is obvious, therefore, to you, when I tell you that no case of burn has ever been reported that has been caused by an exposure of less than twenty minutes, that there is far more danger to the operator than to the patient; but even so, with moderate care in refraining from unnecessary exposure to the rays, the operator is perfectly safe from anything more than a slight reddening of the hands. Today, where a patient becomes burned, it is caused only by gross negligence on the part of the operator, unless of course the rays are being used as a therapeutic agent, in which case it may be necessary to produce a burn in order to cure the more serious lesion.

The applications of the X rays have been discussed so often in the journals, and even in the newspapers, that to dwell on the general uses of the Roentgen rays would but waste your time and mine. I will therefore confine myself to presenting the results of the use of the rays from a diagnostic point of view, as will be shown by radiographs we will soon project upon the screen [some of which are here reproduced—see Figs. 1, 2, 3, 4, 5], and to the most recent application of X-ray science in dentistry, namely the treatment of pyorrhea alveolaris by means of the Roentgen rays, the bi-ultra-violet rays, and high-frequency currents.

Up to a very recent time radio-therapeutics was considered to be of no practical value to the dentist, but now there are indications that seem most promising to the dental practitioner. In the *Cosmos* of December 1903 there appeared an article by Dr. Chas. H. Parker of Chicago, on the treatment of pyorrhea

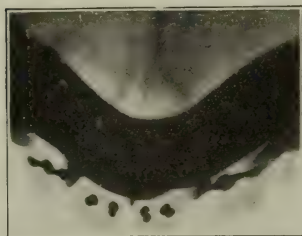
alveolaris by means of the X ray and high-frequency currents. In this paper Dr. Parker claims great results, but states that he had found that the X ray alone would not cure pyorrhea.

His treatment consisted in giving the X ray alone for about two minutes, then

high-frequency currents through the body, actually setting up cataphoric action and at the same time bathing the gums in the rich radiations of the bi-ultra-violet ray.

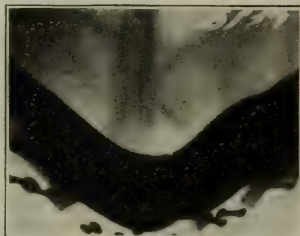
A solution of adrenalin chlorid is used in place of the iodine mixture. The pur-

FIG. 1.



Full upper plate under X ray.

FIG. 2.

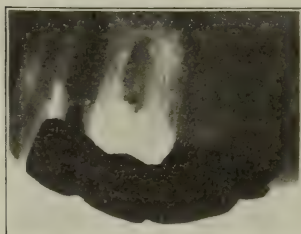


Full upper plate under X ray.

following it up by high-frequency currents from a large electrode placed over the patient's mouth. He first used a spray of aconite, iodine, myrrh, and wintergreen. This mixture, he says, is carried into the gums and tissues by the high-frequency currents.

pose of this solution is to blanch the tissue, both on the surface and internally, in order that the bi-ultra-violet ray may not be impeded in its passage through the tissue. This treatment, in combination with the X ray, has proved very successful in a number of cases, and

FIG. 3.



Non-extracted root above bridge work.

FIG. 4.



Non-erupted and horizontally impacted tooth.

At the college we gave this treatment many trials with good success, but found that there were ways of improvement.

After much experimenting, I devised a vacuum electrode that can be placed directly in the patient's mouth in contact with the gums over the diseased teeth, and another electrode to be held in the hand, thus getting a circuit of the

in the early stage of pyorrhea where the alveolus has not been entirely sloughed away we may claim a complete cure, the teeth tightening up, with restoration of the gums to a healthy condition. We hope that the future may continue to prove that at last a cure has been found for this *bête noire* of the dental surgeon.

REMARKS ON THE ILLUSTRATIONS.

Figs. 1 and 2 are radiographs taken on the platform during the reading of the above paper. As no volunteers among the members of the association presented, the janitor of the hall kindly consented to be a subject. It was not till after taking the pictures that I learned that he had a full upper plate. These pictures are reproduced here since they present to us the curious appearance of a plate under the X ray. The porcelain teeth,

black. This is the first time, to my knowledge, that an enlargement (other than a lantern slide) has been made of a dental radiograph. The picture presents a normal condition showing the first and second molars and part of the roots of the first bicuspid and third molar.

I wish particularly to call attention to the appearance of the normal alveolar process as compared with the regular bone structure under the X rays; but that is only one of the many features that characterize this mode

FIG. 5.



Enlarged negative print of dental radiograph.

owing to their lack of density, are hardly to be seen, while the metallic pins show up black in contrast.

Fig. 3 is a radiograph taken of Dr. Youngblood, which shows a non-extracted root above the bridge.

Fig. 4 is taken of Dr. Tenney Barker, and shows an impacted tooth in a position perpendicular to the plane of the normal teeth; in other words, we are looking at what appears to be a cross section of the impacted tooth. The last two radiographs were taken upon the platform directly after the conclusion of the discussion on the paper.

Fig. 5 represents a dental radiograph enlarged to four times its normal size, and is a negative instead of a positive print, or in other words the color contrasts are reversed, since the teeth show out white instead of

of representation when placed in the hands of the dentist, or even of the dental student.

Can we not say that the practice of dental surgery has made another advance and achieved still another triumph, when a magnified pictorial and true representation of almost all pathological conditions of the mouth is to be realized? It is but a question of time when the X ray will stand on as firm a footing in dentistry as the dental engine or other confirmed mechanical necessity; but it will never become as universal, since we must have trained operators to use it, and the average practitioner will not be able to give up his time to the study and practice of the X ray and its methods. It will therefore be for specialists to develop and to exhibit the wonders of this all-powerful diagnostic if not therapeutic agent.

THE FOURTH INTERNATIONAL DENTAL CONGRESS.

By EDWARD C. KIRK, D.D.S., Sc.D., Philadelphia, Pa.

(Abstract of a paper read before the Pennsylvania State Dental Society at Wilkesbarre, Pa., July 13, 1904.)

WHAT first appeals to us in the consideration of this Congress is the magnitude of its several features and the extent of the interest which the world of dentistry is manifesting in the outcome of the meeting.

There has been called to meet in St. Louis next month a gathering of dentists representing every civilized country on the globe. Each nation having any importance from the standpoint of professional dentistry will be represented by its practitioners and will contribute to the program the latest development of its dental progress, so that as a whole the St. Louis Congress will constitute an exhibit of the world's dentistry at this dawn of the twentieth century.

To prepare for this great event has been the work assigned to a special committee appointed by the National Dental Association at its meeting in 1902 at Niagara Falls, and confirmed by the Directory of Congresses of the St. Louis Exposition in 1903.

Notwithstanding the comparatively limited time at command since the inception of the movement, the work of organization has proceeded rapidly and upon systematic lines. Committees of publicity and propaganda have been formed in every important country of Europe, as well as in Australia and Japan, so that twenty or more nations are now concerned in this movement and are actively spreading an interest and securing support in every way for the meeting. Contributions to all departments of the program are rapidly coming in, and to an extent that is causing no small difficulty in regard to their disposal. Each state in our Union is organized by the appointment of state chairmen, who, working with their local com-

mittees, are collectively preparing the part which the United States is to perform in this dental congress of all nations.

While it is not possible to give exact figures, it may be safely stated that not less than fifteen hundred committeemen are actively at work throughout the world in preparing for the events which will together constitute the Fourth International Dental Congress. Upwards of three hundred clinical demonstrations are being provided for. The ten sectional divisions of the Congress which will hold simultaneous meetings will produce not less than one hundred to one hundred and fifty essays by the leaders of dental thought in all countries, covering all departments of our profession. Dental education, legislation, history, and nomenclature will be the subjects of comprehensive reports made by experts who have for years made these subjects a specialty.

The dealers' and manufacturers' exhibit of dental supplies now includes a larger catalogue of individual exhibits than has heretofore appeared in connection with any dental meeting.

As to the probable number of members who will participate, the indications now point to a larger paid membership than has ever before attended an international dental congress.

The provisions being made by the local Committee of Arrangements for the care and entertainment of members are upon a scale which assures the success of the social feature of the Congress,—a feature which, after all, is the most important civilizing influence in our dental meetings, and one which in a great international gathering contributes the most toward harmonizing the different na-

tional ideals, thus aiding the progress of dentistry as a whole.

To those in position to watch the growth of this world movement of our profession toward a common object the view is an inspiring one. The conception of our calling derived from a local environment at once loses its significance in the broader aspect which the international feature of this Congress presents for consideration. In our local, state, and national associations we meet with differences of opinion as to theory and practice, and out of the multitude of counsel we extract the grist of that wisdom which becomes in time our accepted standard of practice; yet this diversity of opinion is among men similarly trained, speaking the same mother tongue, having the same patriotic sentiments and similar professional ideals. In an international congress are brought together the products of the most diverse systems of training, with corresponding differences of method and theory and the added diversity of language and national characteristics which act as modifying influences in shaping the professional tendencies of each nation toward its own standards and aims. Yet notwithstanding these characteristic national differences there remains the one professional ideal as the feature common to dentistry in all nations—the salvation of the human denture and the one animating desire to solve the problems of our calling upon an independent professional basis.

The attitude of mind of our professional organization, if I may so express it, has needed the developing influence of experience to so ripen it that a clearer conception of the position of dentistry among the beneficent callings of mankind might be formulated, and during the past twenty years the needed experience has come with its fruit of ripened judgment as a consequence.

In 1889, France issued a call for the First International Dental Congress. Previous to this the seeds of internationalism in dental associative work were sown by the establishment of a dental section at the International Medical Congress held in

London in 1881, and repeated at the International Congress in Philadelphia in 1887. At these meetings the leaders of dentistry of the several nations were brought into contact, and there was born the realization that while all were striving for a common ideal the methods of each were widely different, and that much good would result from a more intimate specialized association that would give opportunity for the comparison and discussion of ideas upon an international and purely dental basis.

The complexity which the international features of the dental professional problem presented were such as could best be worked out upon a basis quite separate from the medical relationship, hence an international congress of dentists dealing exclusively with dentistry was determined upon; and it was France, whose leaders of dental thought were most deeply impressed with this idea, that took the initiative.

The Dental Congress of 1889, held in Paris, was an abundant success, which revealed the fact that the sentiment was strongly in favor of the independence of dentistry as a profession. This first purely dental congress international in scope accomplished the still more important result of practically demonstrating the good which might flow to all concerned by periodically bringing together in harmonious relationship the dental representatives of all nations for the discussion of those problems which are vital to the progress and success of dentistry as a profession throughout the world. In 1893 the Second International Dental Congress was held in Chicago, as the World's Columbian Dental Congress, and the third of these reunions was held in Paris in 1900. Each subsequent congress exceeded its predecessor in importance both as to magnitude of membership, output of work, and general character of results. Especially there should be noted in this connection the growth of the spirit of internationalism in dentistry with each succeeding congress. The active and leading men of all nations have on each occasion been brought into close personal contact, and have learned

to regard with respect the efforts which all are making to develop those factors which in each country are placing dentistry upon a higher scientific and social plane.

That type of self-sufficiency and conceit begotten of ignorance which offends decency with its blatant claim of superiority over all others has been made unpopular by these great international meetings, and that higher and nobler spirit of according honor and praise to him who is deserving thereof regardless of his nativity or the language in which he expresses his thought is becoming the dominating principle in these associations;—all of which is as it should be.

Dentistry has outgrown its swaddling-clothes and is now in the period of a strong and lusty adolescence. It has grown into that independence to which it was from the first destined by virtue of its inherent usefulness to humanity. But it has grown otherwise. In the reaching outward of its spheres of influence it has escaped the geographical bounds which limit the activities of nations, and finding sympathetic response in the touch of the dental professional spirit in other nations has laid the first foundations for the formation of a dental world power which shall know no national limitations, but which shall regard our calling as of that higher order of truth and knowledge that is the exclusive possession of no country, though native it may be to some, yet withal a citizen of the world.

It will be seen that the international dental congress fulfills a function with which our state and national organizations are not directly concerned nor are they competent to deal. We discuss questions of education, legislation, and reciprocity, but in their international aspects these matters develop a much wider significance. Our national pride and our patriotism are touched unpleasantly when, for example, Germany enacts legislation excluding the American graduate from using his doctor title while practicing within her territory; yet in all justice there is something to be said in defense of this attitude upon the part of our transatlantic neighbor,

and it is the function and purpose of the international congress to develop the kind of attitude and produce the evidence that in the course of time will set such matters straight.

The international congress movement is a movement toward harmony, aiming by comparison and discussion of those conflicting views which interfere with dental progress to bring about a readjustment of relations upon the basis of greatest advantage to our profession throughout the world.

Much has already been accomplished. The spirit of internationalism in dentistry has taken root and is rapidly spreading its influence among the nations, so that already the fruits of its harmonizing tendency are apparent.

Not the least important step which has been taken toward conserving and developing this international spirit of confraternity among dental practitioners the world over is the creation at the Paris Congress of the *Fédération Dentaire Internationale*, an organization of all the delegates representing the several nations at the Congress of 1900. The purposes of this Federation are to foster the objects for which international congresses are held—to promote and assist all movements which in an international way can contribute to the advancement of the profession of dentistry. The Federation is represented by an Executive Council which has power to act upon behalf of the Federation as an *ad interim* committee, to accept invitations to hold international congresses, and to designate the time and place for holding them. The organization of the international movement is thus planned and assured upon systematic lines, and it is at St. Louis in America that the first period of organized activity of this great power in dentistry will be terminated and the second period inaugurated.

In all probability it will be many years before such a notable meeting will again be accessible to American practitioners in their own country. We are on the eve of perhaps the greatest event in the history of the world's dentistry. Every professional consideration, every purely

selfish interest, alike demands that we should take an active part in this Congress. Let the man who claims that American dentistry leads the world go to St. Louis and help to substantiate that claim next month or else hereafter forever hold his peace. America has issued the invitation, you have taken your part in confirming the action of our national association in asking the dental representatives of the nations of the earth to be

your guests at St. Louis. The committee has done its work, the feast is prepared, the guests are even now arriving. Let us one and all embrace the opportunity to show them in the best sense our quality as hosts, and at the same time learn something in a practical way of the good which must accrue to our profession from the development of the international idea, and then give it practical furtherance by our individual efforts.

PORCELAIN INLAYS.

By JAMES O. WELLS, A.M., D.M.D., Minneapolis, Minn.

(Read before the Twin City Dental Club, January 9, 1904.)

I SHALL take up this subject in the following order: Application, selecting the shades, cavities, matrices, bodies, fusing, and setting.

In designating the field of usefulness of the porcelain inlay I would have you understand that, in the opinion of the writer of this paper, it is by no means universal in its application from the standpoint of a general office practice, nor is it unduly limited to a narrow range of cases when measured by the same standard. In other words, there is a field for the porcelain inlay, as well as there is for the gold, amalgam, and cement filling. There is no question but that the inlay is an assured success; it is not a fad; it is here to stay, and, more than this, there is a class of cases where porcelain as a filling material is so far ahead of anything else for the restoration of lost tooth-structure that it becomes imperative for every progressive dentist to recognize these cases when they present, and to possess the necessary skill to insert a practical porcelain inlay.

It becomes necessary, then, to determine in what cases porcelain as a filling material is indicated in preference to other materials. Of course this is a

question of personal opinion; there are those who claim that porcelain is universal in its application; on the other hand, there are those who assert that it is a dismal failure. Both of these positions are those of the extremist; each is equally untenable; the one is that of the extremist, who perhaps is porcelain's greatest enemy in his foolish attempts to use it in cases where it is especially contra-indicated and where failure only can result; the other is that of the operator who, either from ignorance or an uncommendable conservatism, condemns that of which he has no practical knowledge, for in most cases the material has not been given an intelligent trial.

FIELD OF THE PORCELAIN INLAY.

In order that I may give you some idea of what I consider the legitimate field of the porcelain inlay, I will say that I think it is indicated in all cases where its esthetic possibilities and low conductivity can be used to advantage. Without question its greatest field of usefulness is based on its esthetic possibilities, since by a skilful manipulation of this material we can so nearly match the natural color of the tooth that even

the patient cannot detect it at conversational distance.

To designate more specifically, I would use porcelain in all labial cavities in the ten anterior teeth of the upper mouth, and also of the lower mouth in all cases where the surrounding tissues are such that the labial surface of these teeth is exposed to view. I would use it in all approximal cavities in the six anterior teeth where enough tooth-structure has been lost to render restoration with gold objectionable. This you see is also a question of personal opinion. In all cases where a considerable amount of the tooth-structure is gone I resort to porcelain, especially in the mouths of women.

I do not hesitate to involve the incisal edge, though I prefer to obviate the necessity of a joint at this position when possible. Not infrequently I restore the incisal third of incisors and canines, fully realizing that this is the most trying position in which we can place an inlay. The esthetic possibilities are so great here that I think we are justifiable in taking advantage of this, even though we do so at the expense of strength, provided always that the strength is sufficient to stand the normal stress. This practice is especially justifiable if the vitality of the tooth be maintained thereby.

As regards the conductivity of the material we find that it is extremely useful in buccal cavities in bicuspid and molars not exposed to view; and in any other deep cavities in vital teeth where a metal filling, owing to the high conductivity of metals, would jeopardize the life of the pulp or the comfort of the patient. There is another class of cases where we can often use porcelain to advantage, viz, abscessed teeth that have resisted therapeutic treatment, but which have finally quieted and in which we fear that the pounding necessary to properly condense a gold filling would start anew the inflammatory process. Yet porcelain is not paramount here, for we can use gold in the form of an inlay to the same advantage, and we would only use porcelain where we desired to take advantage

of its esthetic possibilities. So much for the application; now let us notice the operation.

COLOR.

The first thing to do is to determine what shades we will use. This is done by a careful study of the shade guide and of the case under consideration. The shades should always be applied in layers, the intensity of the color depending in a degree upon the thickness of the layer. It is always necessary to use two or more underlying shades and one or more overlying (or blending) shades to get a natural effect. The tooth and shade guide should be carefully studied with the patient in an upright position and the light shining in a normal direction. You should then make a memorandum of your conclusions and proceed with the operation.

CAVITY PREPARATION.

This brings us to the cavity preparation. There is not a great deal that I desire to say on this subject to you, who are familiar with scientific cavity preparation for other materials. Yet there are a few points wherein these cavities differ from others that are so important that I will mention them.

It is not necessary in these cavities to resort to the same degree of extension as in cavities for gold, since there is seldom a recurrence of decay around a porcelain inlay. The outline form is secured by extending to sound dentin. Of course all decayed dentin, and also all discolored dentin where it is liable to affect the shade of the tooth, should be removed. It is not always necessary to remove all unsupported enamel, yet this should always be cut away when exposed to view, since the underlying cement usually affects the shade of the tooth. Resistance form is just as important here as elsewhere, and cavities should always be constructed according to scientific principles as regards the direction of cavity walls, the angle of the seat, and the bulk of the filling. Although retention in the form of undercuts is excluded from these cavities, this

being a radical departure from cavities in general, yet retention in the position of the walls, by grooving, and by other means when possible, should be resorted to. I would discourage the practice of baking pins into inlays for this purpose, since in my opinion it is more disastrous than beneficial. In those cases where a pin seems to be indicated I have had better results by deepening the cavity and thus securing better anchorage. Margins should never be beveled; they should always form a right angle with the axial surface of the tooth, except in such positions as would place an acute angle in the margin of the inlay. In these positions the acute angle should be placed in the margin of the cavity. We should avoid straight lines in the margins as much as possible, for we obtain much better color effects if the labial and buccal margins are graceful waves rather than straight lines. The form of all cavities involving one surface should be such that the position of the inlay may be determined at a glance.

MATRICES.

As regards matrices, there are two materials used for this purpose: gold for low- and platinum for high-fusing bodies. Since I think high-fusing bodies are the better for practical purposes, what I have to say of matrices in this paper will refer to platinum. The metal should be pure, rolled to 1/1000 of an inch in thickness, and thoroughly annealed. It is best annealed when placed in the electric furnace, heated to a white heat, and allowed to cool. During the process of burnishing the Bunsen will be found to afford sufficient heat for the repeated annealings necessary during the formation of the matrix.

There are two methods of forming the matrix: one is to burnish the metal directly into the cavity, the other is to swage the metal over an impression of the cavity. Both of these methods have their champions, and both, of course, have their advantages and disadvantages. I think that after everything has been considered the former is the more prac-

tical, and I shall confine myself more especially to that method in this paper.

Suitable burnishers and pledgets of moist cotton are the most effective instruments for burnishing. When you are ready to begin this part of the operation a piece of metal large enough to lap over on the axial surface of the tooth sufficiently to guide you in forming the contour should be obtained. It should be annealed, placed over the cavity, and with a pledget of moist cotton gently pressed to place with sufficient force to mark the outline of the cavity; the metal should then be removed and the excess cut away. We should now with suitable instruments and frequent annealings, to prevent tearing or folding, burnish the metal perfectly to the walls of the cavity. The cavity should then, with the partially burnished matrix in position, be filled with moist cotton, and the metal, which should be recently annealed, carefully burnished to the axial surfaces of the tooth. When this is accomplished the matrix should be removed, re-annealed, and replaced in the cavity; then with the matrix in position the cavity should be packed with moist cotton till the cotton hangs over on the axial surfaces of the tooth. Place a piece of tape or the edge of the napkin over the cotton, stretch tightly, and burnish thoroughly; remove the tape or napkin and cotton, and apply pressure to one side of the matrix. If this does not dislodge it the adaptation is perfect; if it does do so, repeat the operation. When the burnishing is completed, carefully remove the matrix and proceed with the operation. In very extensive cavities it is advisable to make the first bake with a foundation body, replace in the cavity and burnish, to overcome warpage.

The other method, briefly, is as follows: Carefully exclude the moisture, dust the cavity and adjacent surfaces of the tooth with soapstone; some essential oil may be sparingly coated over these surfaces to make the soapstone adhere. Make a mix of the yellow powder of Britton's cement of such consistence that you may handle it with the fingers. Roll the cement into a pellet of suitable size

and drop into soapstone to coat the surface; blow off the excess powder and press into the cavity, securing at the same time an impression of the axial surfaces of the tooth. The cement is allowed to set, then removed; it is then reinforced with the gray powder of the same cement and allowed to stand several hours till thoroughly set. The reinforced impression is then properly trimmed, placed in a suitable swaging apparatus, and the matrix is swaged over this impression of the cavity.

In taking impressions of approximal cavities a thin strip of aluminum wide enough to cover the cavity is placed between the teeth, and bent around the adjacent tooth to expose the cavity. The cement is then pressed into the cavity and the aluminum bent over the cement. By exerting pressure upon the aluminum with the thumb and forefinger the cement is pressed into the cavity and over the axial surfaces of the tooth. To gain space to remove the impression pass a burnisher between the aluminum and adjacent tooth. Additional space should be previously obtained by the immediate method when necessary.

This method is long, tedious, and slow, and aside from the fact that a second matrix can be obtained when necessary without annoyance or loss of time to the patient it possesses no real advantage over that first considered, while the detail and the consumption of time alone render it impracticable for the busy operator.

As regards investing the matrix, nearly all operators who swage invest the matrix before fusing the inlay. Personally, I do not think it ever necessary to invest a matrix; my conclusion is based upon practical clinical experience. It is a great waste of time and a hindrance rather than an aid to securing the best results.

PORCELAIN BODIES.

This brings us to a consideration of bodies. As I stated elsewhere, my opinion is that a high-fusing body is better for practical purposes, this conclusion being also based upon practical experience.

The colors are more natural and stable, the body retains its form better under heat, and is easier to manipulate. A good body for this purpose should be made in two grades, foundation and enamel; should be finely ground, and have a dozen or more shades. I obtain the best results with Brewster's bodies.

The shades should be mixed to the proper consistence, the matrix grasped by one edge with a pair of lock pliers, and the shades placed in their respective positions. A serrated instrument drawn over the edge of the pliers will bring the moisture to the surface, and cause the particles of the body to assume a compact condition, when the jarring should cease, else the color effect will be spoiled by mixing the shades. The moisture should now be blotted off with a clean napkin.

The shades may be applied separately and baked separately; or two or more may be applied, and baked at the same time. In all cases, however, the underlying shades should be applied in sufficient quantity to give the desired effect, and baked before the overlying or blending shades are applied. Just which and how much of each shade should be used to give the desired effect can be learned only by close application and study, but anyone can become so skilled that he may be sure of a good contour and color. When a foundation body is used the matrix should be filled to contour, and the labial or buccal half cut away; this is then fused, and the shades applied afterward.

FUSING.

Much care is necessary in fusing the body. We should remember always that an under-fused body is darker, while an over-fused body is lighter than the shade guide. Complete fusion is accomplished as soon as we have a perfect glaze. There are many methods of arriving at this degree of fusion. The one that experience has demonstrated to me to be the best is to know the exact time in which a given furnace will fuse a given body. You may use the gold test and watch the body in the furnace, but this is injurious to the eyes; you may remove

the piece from the furnace with impunity and look at it, but it should be borne in mind here that we sometimes so arrest the process of fusion by this method that we have a granular surface resulting, which no amount of heating short of over-fusing will overcome, and for this reason we should be careful in the final bake. A granular surface is desirable at all previous bakes, since it facilitates the application of additional body. It should be remembered also that a given furnace after it has been heating a half-hour or so will fuse a given body in a shorter time than it would at first. After the inlay has been completed, or presumably so, before the matrix is stripped off, it may be tried in the cavity and the contour verified. I rely on my judgment here, aided by a pair of delicate dividers, and seldom place an inlay in the cavity previous to stripping the matrix.

SETTING.

The matrix should now be stripped off, and the under surface of the inlay etched, either with a gem point or by coating the axial surfaces with wax and immersing in a bath of hydrofluoric acid. The inlay is now ready to be inserted in the cavity, to determine the color of the cement. Of course what we need for this work is a transparent cement; but, not having this, we must make the best of what we have. In a majority of cases

we will find that a light yellow cement will give the best results, but there are cases where some other shade is better. The way to determine this is to take a bit of the various powders, mix with water, place this mixture in the cavity, and insert the inlay; you will readily see which gives the best result. The tooth should not be allowed to become dry, since this will bleach it, but should be maintained at its normal color till this part of the operation is passed.

The inlay is now ready to set, and for this purpose I always use Harvard cement. The dam should be applied, the cavity wiped out with alcohol or hydrogen dioxid and thoroughly dried; if the cavity preparation be correct, no undercutting is necessary. The cement should be mixed to the same consistence as for crowns, or a little thinner, and applied to the cavity and etched surface of the inlay, which should have been previously treated in the same manner as the cavity. The inlay is now pressed to place with sufficient force to exclude all surplus cement. It should then be allowed to set under pressure, obtained by wedging with a toothpick or tying with a ligature for from twenty to thirty minutes, when you may remove the pressure and, with a fine white strip, strip away any excess cement that may remain. If necessary, you may go over the joint with a fine white stone. The dam is now removed and the patient dismissed.

PROCEEDINGS OF SOCIETIES.

NEW HAVEN DENTAL ASSOCIATION.

First Annual Convention.

(Continued from page 574.)

H. C. BOENNING, M.D., Philadelphia, then read a paper entitled "Some Views on Fractures of the Lower Jaw." (Printed in full at page 429 of the June issue of the COSMOS.)

Discussion.

W. H. CARMALT, M.D., New Haven. With regard to the paper just read and the question of the treatment of fractures of the lower jaw, I beg to say that I am in the habit of saying to my class in surgery that whenever they have fractures of the mandible, if they have any difficulty whatever, they should call in the services of and consult with a dentist, for that in the treatment of these fractures almost every appliance we use can be improved upon by the man doing dental work. I always give them this advice, and I hope they will follow it.

The title of the paper read is somewhat different from that kindly given to me by Dr. Boenning to look over. I had expected him to deal more with the causes of fractures than with the treatment, and I feel myself rather more competent to discuss causes than treatment. I came here hoping to get ideas from the dental profession that would assist me in the treatment of these fractures. With regard to the paper as read, in speaking of the causes of fractures the doctor dwells upon the fracture caused by "vibration and recoil," which is the same thing, and illustrates this by comparison with fractures at the base of the cranium. He describes and speaks of fracture by *contre-coup*, that is, where the fracture

is at the opposite side from where the force is applied, there being no fracture at the latter point; and while I do not deny that there may be fractures of the skull by *contre-coup*, they are nevertheless very rare. When I speak of the skull, I speak of it as a single bone, as Dr. Boenning uses it. In a series of experiments carried on by Dr. Arran on cadavers in which the skulls were subjected to blows by blunt instruments over the vertex, and also by being dropped from different heights, which are the blows that are referred to as giving rise to the fracture by *contre-coup*, he found that there was always a fracture at the point of reception of the injury, though a greater one at the base, this being the one inflicting the main injury. Such fractures must be regarded as radiating fractures and not fractures by *contre-coup*.

Let us think about how the force is applied. To be sure, when a blow is received from a brick falling from a height, if there were no resistance the skull would go off into infinity. The point of resistance is the top of the spinal column; the force is applied from below, and the fracture is at the situation of the receipt of force. It yields at this point for various reasons, one of the principal reasons being that there is less compactness of substance. If you reverse the position, as when one falls on his head, the weight of the body is then the force striking from above, and fractures the skull at the base, the point of contact.

Dr. Arran made three points in his

essay. First: In no experiment was a fracture of the base produced without a fracture at the point where the blow was received. Second: Fractures from a fall usually radiate to the base without regard to the sutures. Third: They take the shortest route to the base, following the curves of smallest radius. These points therefore disprove the view of *contre-coup* fractures as a usual occurrence in the fractures of the head.

Applying these points to the fractures of the lower jaw, there is very much less probability of the influence of "vibration and recoil" or fracture by *contre-coup* than in the skull, the shape of the jaw being so irregular. It has two distinct directions, the lower part running more or less horizontally backward, the rami running upward nearly parallel, there being no curve to them, and then articulating with the base; and though this articulation is rather firm it is not so firm as the bone itself. This is quite different from the fairly regular curve of bones of the skull, and I cannot regard the two as legitimately comparable in this discussion, so that when we consider the "punch soporific," which I understand to be a blow at the angle of the jaw directed upward, the end of the jaw-bone is driven against the skull, causing concussion of the brain, which produces the soporific effect upon the man receiving it; and I think that that means that the force is communicated directly to the brain itself. As is well known, the brain does not fill the skull cavity; there is a space between the brain and the skull.

Another set of experiments was carried out for the purpose of explaining the reason of the rupture of the meninges in blows received at the opposite side—that is the proper conception of the fracture by *contre-coup*. In these experiments the skull was filled with paraffin and let fall from a height upon the vertex. It was found, in every case, that there was a flattening of the paraffin on the opposite side, *i.e.* at the base. I know that it does not do to cite individual cases in opposition to a question of this kind, because we cannot know all the various forces which are brought to bear to pro-

duce a certain effect, but in regard to this kind of blow on the mandible producing, as claimed, fractures of the two sides by recoil, I cannot but regard them as due to direct violence, inasmuch as we have other instances in which the condyles are driven directly into the brain. Cases of injury inside the skull cavity by blows on the chin are not fractures by *contre-coup*, but by direct force. In the instance which the doctor cites of the pugilist who received fractures of the condyle and ramus of the opposite side, the fracture must be due to direct force rather than by *contre-coup*.

I do not know whether to congratulate my side of the profession or to commiserate yours when the doctor describes his method of treating fractures of the lower jaw by wiring. I have done that for a great many years. I always do that if I cannot get a dentist to help me out in splinting them, but I regard it as a misfortune, although by immobilizing it promotes union. No matter how carefully you do it, you make a communication with the cavity of the mouth in drilling; and there is danger of the wire, even if imbedded in the tissues, becoming contaminated, and the bone becoming infected through the drill-holes. For these reasons I regard it as a misfortune to have to do it. It may, however, be the best thing in some cases.

With regard to individual interdental splints, you are undoubtedly more familiar with them than I am, but I venture very deferentially to say that from the descriptions and from observation of the interdental splint of vulcanite with wires extending out backward to be fastened behind the head and underneath the jaw, allowing the jaw to be moved to a certain extent, it is better than the old way of bandaging the lower to the upper jaw, and if this method will answer every purpose I should think that a great deal has been gained. I have seen this described in Scudder's "Treatment of Fractures" as the Moriarty splint. If, however, the interdental splint will not answer the purpose, there is a scheme of fitting a plate underneath the lower jaw and wires passing from the splint on the

teeth and attached to this plate with screws, which is entirely possible. That seems to be a very excellent splint theoretically, but I do not know how practical it would be.

There is one other point the essayist spoke of that I would like to emphasize, and that is the importance of oral sanitation in the treatment of fractures of the jaws. There is no portion of the body so difficult to keep clean, and all he has said on that meets my most hearty approval.

Dr. J. E. POWER, Providence, R. I. It is embarrassing to discuss a paper by a man whose standing in his profession is of unquestioned superiority. Permit me to premise, however, that in accepting a part in the discussion I do not thus assume an attitude of criticism. True science aims at the attainment of truth. Honest discussion tends to that aim, and in such discussion the individual opinion must be taken simply for what it is worth.

Although I have had some experience in the surgical treatment of fractures, I must also admit that my experience has been chiefly confined to the adjustment of mechanical appliances, and naturally my remarks will be in accordance therewith.

Examination is the first, and probably the most important, step in the treatment of any disease, as by it we form our diagnosis, and upon this base our treatment. It is customary with me to examine every portion of the bone, starting at the angle and proceeding around the mouth to the angle on the opposite side, then the rami, etc., until I am sure that I have found all the fractures.

Fractures of the mandible, according to some of the best writers, are amongst the most difficult ones which the surgeon is called upon to treat. There are various methods of treating these fractures, as is pointed out by the essayist, and I dare say that in the hands of the right men good results may be obtained from any of those suggested. The principal methods are bandaging, ligating the teeth, wiring the broken fragments together, and mechanical appliances adjusted in the mouth.

In adopting any of these various methods, our first aim is to restore the existing condition to normal, next to support the fragments as immovably as possible, thereby observing one of the cardinal rules of surgery—rest; and this condition is only brought about by fixation of the fragments. In wiring the fragments, at best a link joint is all that can be obtained, and although great care might be exercised in drawing the wire tight, I have seen some cases where the wire stretched and even broke, presumably as a result of muscular action; again, the pressure upon the sides of the bone will cause absorption and naturally lessen the support. In these instances we get frictional irritation and all the other progressive steps of inflammation, to suppuration, and finally death of the part. It seems to me that the infliction of irritating wounds upon the ends of the parts to be healed is inconsistent with the rules of surgery, and the tendency toward sepsis far greater than when the parts are held in correct apposition by a scientifically constructed mechanical appliance which will allow frequent and thorough cleansing of the oral cavity.

Delayed union and ununited fractures, from my own experience and observation, are rare. Infection or inflammation is generally the cause of delayed union, although it is well to remember that the physical condition of the individual may either retard or promote it, as any condition which would inhibit the tissue-building of any organ would also inhibit osteogenetic action.

Perverted alignment, deformity, necrosis, loss of teeth, etc., are far less frequent when these fractures are treated by mechanical appliances than when treated surgically, not to mention the after-appearance of the patient, his convenience, the time consumed both by patient and operator, and the absence of anesthetics, except in rare instances.

If the teeth of the upper jaw occlude with those of the lower, anatomically, it must follow that the fragments are in position. It is upon this principle that scientifically constructed splints are based.

In making splints for fractures, I use plaster-of-Paris models of the jaws, produced from impressions taken directly from the patient. I make no attempt to hold the fragments in position while the impressions are being taken, and the models which are produced from these impressions give either the condition existing at the time of fracture or an exaggerated condition due to the pressure exerted by the substance used in taking the impression causing the fragments to separate.

From previous examination I know where the fractures are, so I saw the models in the places corresponding to the fracture, and reconstruct them according to the occlusion, which varies in every case, and in so doing I am governed by the history, abraded surfaces of the teeth, pipe-marks, etc. Next I construct my splint, which for body fractures is made of aluminum, and cement it to the teeth. When this is in position I know I have accomplished fixation, have not interfered with the personal appearance of the patient, and have also given him the free use of his jaws.

Dr. D. H. ALLIS, Springfield, Mass. I want to express my appreciation of the position Dr. Carmalt has taken with regard to consulting the dentist in cases of fractures of the jaw. This is the right thing to do, and should be encouraged on the part of the medical men, as it allows us to take impressions of the mouth before much swelling has taken place.

The most practical thing that we can do in the treatment of these fractures of the lower jaw is to make an appliance that will promote union of the parts and allow the patient to go on with his everyday duties as much as possible. In the hospital, where we come in contact with most cases that demand this kind of treatment, we keep away from wiring unless it is absolutely necessary. In seventeen years I have wired but one case. The interdental splint spoken of by Dr. Carmalt, the Moriarty splint, has been very effective in my hands.

Dr. M. C. SMITH, Lynn, Mass. I agree with the essayist in many of his remarks, and disagree with him in others. I would

like to impress upon you more strongly the sentiment expressed as to medical men conferring with the dentist in the treatment of fractures of the jaws, and also the importance of looking for fracture number two. I recall one case of a lady treated in a large hospital for fracture of the lower jaw, and when the splint was taken off she was shown as a star patient with results as good as could be hoped for, and that it was unnecessary to turn these patients over to dentists and let the latter have the credit. Later she fell into my hands. While obtaining a good result with the fracture in the region of the right bicuspid, they had not discovered fracture number two, and an ununited fracture at the neck of the condyle on the left side was giving her considerable trouble. A few weeks later she was struck on the left side, in the region of the bicuspid, and the lower jaw fractured at the point of contact, resulting in fracture number two. At the neck of the condyle on the right side, by keeping the jaws in splints for some time, we got good union in the two recent fractures, and a good movable joint, and one which she could use without pain, in the old fracture at the neck of the condyle.

One point I was not prepared for, and that is to come here and listen to a man from Philadelphia, the center of dental education in this country, and who was a student of the venerable Dr. Garretson, advocate wiring the jaw in fractures. It is true that locality has much to do with the treatment of fractures. We have in our city a mortality of nearly forty per cent. in fractures of the jaw. The character of the fractures that we have to deal with is different from those of most localities. The kind of fractures we have to deal with are largely caused by railroad accidents, especially accidents to people jumping from through trains, and these are often complicated with fractures at the base of the brain. Fractures of both upper and lower jaws, complicated with other injuries of the head and face, require different treatment from simple fractures of the lower jaw.

I will mention one case as an example

of the character of fractures we have to treat. A young lady, while coasting on a double runner, was thrown off and struck on the head, the lower jaw being fractured in four places. The upper jaw was fractured through the median line, all the bones of the left side of the face were crushed, both eyes injured, and she also received two large scalp wounds. Had the force of the blow been one-third less, I believe she would have been killed instantly, as there would undoubtedly have been a fracture at the base of the brain. As it was, however, the momentum was so great that the bones of the face were crushed and the force was not carried back to the spinal column. In this case there was no fracture number two at the opposite side from the point of contact. This case yielded nicely to the interdental splint, with bandages over the head. We were not able to get much pressure on the bandages on account of the scalp wounds.

The interdental splint has many points of merit. If one or more of the teeth are lower than the others, a little piece of soft rubber put into the impression corresponding to the elongated tooth will produce gentle pressure on that tooth. The rubber can be put into place as soon as the deformity is noticed, and you will be surprised how quickly it will move the teeth into place. Make a good big splint with a big hole in front, and you can bandage the jaws better if the mouth is wide open. This can be removed every day and the mouth washed if necessary.

Dr. G. LENOX CURTIS, New York. I disagree with Dr. Boenning in regard to wiring, and I just want to emphasize what has been said in opposition to it. The essayist did not take up the subject of treatment as much as I had hoped for. Of course there are no set rules laid down for treating fractures, but these must meet the cases as presented. Wiring I think can be done away with—I would not like to say absolutely, but it never occurs in my practice. It must be necessary, however, for those who are not expert in adjusting interdental splints. I almost invariably at first adjust a temporary splint made of modeling compo-

sition. This allows us to adjust the parts and make a new impression in the course of a few days and get a better adjustment of the parts. In comminuted fractures I usually take an impression of the upper and lower teeth, from which I make a cast; then saw this cast into sections sufficiently to properly articulate them; upon this cast a splint is constructed, and in this the teeth are held until union of the bones is complete. After the splint has been removed, the occlusion is usually found perfect.

The point of sepsis and uncleanness was touched upon in connection with wiring, and it cannot be avoided, but I believe I get better results by using an interdental splint and cementing it upon the teeth, filling in all the spaces between the teeth, splint, and gums with zinc oxyphosphate. I rarely ever see any inflammation. I grind down the splint until the upper and lower teeth, as the case may be, will occlude. The articulation is such that the patient can masticate food with little difficulty. The patients can go about their business as before with very little inconvenience, and without wearing bandages, as is usual in wiring.

If Dr. Boenning means that there are pus germs present in pyorrhea alveolaris I take no exception, but if he means that the etiology of pyorrhea alveolaris is the pus germ, then I must differ with him. Furthermore, if he means to infer that pyorrhea alveolaris continues indefinitely after the teeth have been extracted, I must say that his experience differs considerably from my own, and that his view conflicts with that of the closest observers and writers on this subject. I have found the quickest and surest method of curing this disease is to extract the teeth.

Dr. E. A. BOGUE, New York. As one of the older men of the profession I might mention one or two incidents that have been brought to my attention in the past few years regarding mistakes made from the lack of co-operation between the dentist and the physician. In the records of one of the hospitals in our city the death of a patient was entered as having been due to the extraction of a tooth. I

followed that case up, and found that somehow, in the extraction of the tooth, a large fracture resulted, which was not discovered until after death. Another case that my friend Dr. Curtis knows very well was that of a third molar that was coming through the gum; a physician was called after extraction, a poultice was applied, and the man died. An old lady fell down stairs and broke her mandible; she was wearing a full set of teeth. The surgeon read up on what to do, and put on a four-tailed bandage, got a cartilaginous union, and the poor lady suffered for a while and died. The surgeon never thought to return the teeth to place. A very distinguished surgeon was called in by myself to consult over the case of a lady who had an external opening or two arising from an impacted lower third molar. This surgeon lanced through the temporal muscle in the middle across the fibers. She did not die in consequence, but she carried that scar to her grave. These are cases where the dentist would have known very well what to do. The mistakes made because the dentist and surgeon do not work together are innumerable.

Dr. BOENNING (closing the discussion). I did not intend to speak further on the subject, and would like to leave the paper on record with the different remarks made here, and invite investigation and examination as to the merit of the discussions. My friends here, however, think that I should answer some of the wild statements made.

Concerning Dr. Carmalt's criticism, in which he referred to the experiments made by Dr. Arran, I will say that those experiments were made on dead men. I operate on live men, and there is as much difference in experiments on dead men and live men as between dead men's teeth and live men's teeth. The tissues of the cadaver have no resiliency and no elasticity. A living human skull will transmit a force to the opposite side where a dead skull will not respond to any vibration.

Dr. Carmalt says that *contre-coup* fractures are mythical. By such fractures I mean the cases where the fracture

is on the opposite side of the skull from that on which the blow is received. Dr. Carmalt's opportunities for observation and investigation must be most limited. He has evidently never visited the collection of fractures in the National Museum at Washington. The next point is in relation to wiring fractures; with this he found fault, and says that the drill-holes become infected. I will say if that is the case, his surgery is defective. There is no reason why a man should have infected drill-holes. I have been practicing this method for over fifteen years, and I have yet to see an infected drill-hole. Infected drill-holes simply mean dirty surgery.

Concerning Dr. Power's criticism with reference to the splint, I will say that his experience is different from mine. I never saw an interdental splint that would stand the force required in mastication.

Dr. Smith remarked that they had a mortality of forty per cent. in fractures of the jaws in his section of the world. I will say that Dr. Smith should come over to Philadelphia, and we will teach him not to have forty per cent., nor four per cent., nor one per cent. of mortality from fractures of the jaws.

I regret that these gentlemen who discussed the paper are not here; I would be most happy to say more were they present. I am glad that I stopped Dr. Bogue from leaving the room, and with reference to Dr. Bogue's criticism I will say that his strictures are due to his inability to distinguish between a proper surgical operation and malpractice. The cases he has cited here are an offence to legitimate surgical practice. Dr. Bogue further said that some famous authority had recently written a book showing that over forty per cent. of wiring cases for fracture of the lower jaw died as the result of the operation. I ask Dr. Bogue for the name of the author and the title of his book.

Dr. BOGUE. One of the latest books written on operative surgery has been translated within the last six months, and gives as the rate of mortality of infection in the inferior maxillary triangle

practically forty per cent., and judging from the results of which I have of late seen somewhat, that may be correct. The translator of the book is Dr. Flint.

The convention then adjourned.

CLINICS.

Dr. J. E. POWER, Providence, R. I., gave a clinic on the "Treatment of Fractured Jaws," demonstrating his method of obtaining the impression, models, etc., and showed the methods of making many different kinds of splints. He paid especial attention to the aluminum splint, showing how the models, dies, and splint were made. This splint he advocates as the best for use in fractured jaws, claiming as its advantages over other splints its ease and rapidity of construction and adjustment, the facility in keeping it strictly clean, and the freedom of motion it allows to the injured jaw. It is cemented on the teeth, thereby holding the fragments in correct apposition, but at the same time permitting the patient to use the jaws in masticating ordinary food.

Dr. H. H. HOSLEY, Springfield, Mass., gave a clinic showing the restoration by porcelain inlay of half of a cusp and sulci in an upper first bicuspid mesial approximal cavity.

Dr. T. S. RUST, Meriden, demonstrated a method of sweating gold bands for crowns and other purposes; also showed method of contouring and baking platinum band porcelain crowns.

Dr. C. FRANK BLIVEN, Worcester, Mass. "Art Studies in Prosthetic Dentistry, Illustrating the Advantages of Artistic Treatment in Individual Cases." This clinic was given to demonstrate the proper selection of artificial teeth and their treatment to meet the requirements of the different ages of life.

It is a frequent practice to employ the same type of teeth for a patient of sixty years of age as for one of twenty, and the result in such cases is decidedly inartistic. The clinic very clearly illustrated this idea.

Dr. F. T. MURLLESS, Jr., Windsor Locks. "Chemico-Metallic Method." Dr. Murlless demonstrated the advantages and usefulness of the method when employed for disinfecting and filling fine and tortuous root-canals, and for rapid sterilization of putrescent canals when immediate root-filling is desired.

Dr. D. HURLBUT ALLIS, Springfield, Mass., presented the models from ten different patients on orthodontia, most of the cases being of contracted palate with protruding upper teeth.

Dr. D. C. TAYLOR, Hartford, showed how cement can be used in connection with gold, building the gold directly on the cement while soft, taking special pains when the filling is three-fourths made to bevel the enamel edge and to burnish the gold on the edges by blurring the burnisher before touching the gold, when the next piece will weld by pressure and burnishing, thereby making a firmly finished gold filling with a cement joint up to the enamel.

He also showed the advantages of mixing a portion of amalgam with the cement to avoid expansion and contraction.

Dr. CHAS. C. SMITH, New Haven. "Four Tooth-bridge Abutments. Richmond Crown on Canine. Gold-Shell Crown on First Molar. Second Bicuspid Diatoric Dummies." The method suggested is as follows: Abutments as usual. Select and grind diatoric dummies. Swage backings for these, cutting an opening corresponding to the hole in the tooth: solder the pin in the hole of the backing. Adjust the teeth to the backings, burnishing gold over the edges of the dummies. Wax to position. Remove the diatorics, invest, and solder. When soldered, cement dummies to place. The advantages are that there is no gold to show on the dummies; they are easily made, with no danger to the porcelain, as in soldering; and they are easily repaired.

LOTHAR VON GRAVE, Wallingford. "Manipulation of Plaster." The clini-

cian discussed gypsum, its nature, practical treatment, and general use in arts and industries, illustrating by practical demonstration the production of a statuette through all stages of the process from the first model to the finished work. He also dealt with the bronze cast, with marginal remarks in reference to the quality of the plaster, the method of mixing for different purposes—accelerating or retarding the setting, reducing, hardening, coloring, repairing, and finishing. Specimens of hardened casts and of various modeling, molding, and carving instruments, were shown, including demonstration of their practical use; also casting from life.

Dr. STANLEY TOWLE, Fall River, Mass. "Inlay Work." Dr. Towle's clinic was for the purpose of showing how a cement filling can be protected in such a manner that it will not waste away, the operation being easy for the patient, and giving when completed the appearance of a gold filling. It is made by adapting into the cavity a matrix of pure gold No. 36 gage, forming and soldering to this an outside form made of 22-k. gold of No. 28 to 30 gage, cutting away a portion of the matrix, thus producing anchorage, and cementing in place.

Dr. Towle also showed how a matrix for a porcelain filling may be made easily and accurately by taking an impression of the cavity in modeling compound.

Dr. WM. Y. ALLEN, Boston, Mass. "Automatic Round Porcelain Inlays." The round porcelain inlay operation—originated by Dr. Wm. Storer How of Philadelphia, in 1867, improved by Mr. Wm. Dall of Glasgow, Scotland, Dr. B. C. Russell of Keene, New Hampshire, and others—forms the basis of the "automatic round inlay system" as demonstrated by Dr. Allen. The essential feature of the system, and the only original idea claimed by Dr. Allen in connection with round inlay operations, consists of a simple instrument called a "round inlay grinder," the action of which is automatic when rotated with the dental engine. By means of this instrument Dr. Allen quickly reduces a porcelain

rod to an accurate taper, from which perfect-fitting inlays may be cut with a diamond disk for circular cavities of any diameter upon all accessible surfaces in either the anterior or posterior teeth, thereby entirely eliminating the difficulties of previous methods of preparing round porcelain inlays.

Dr. ROBERT EUGENE PAYNE, New York. "Correcting Deformities in the Shapes of Natural Teeth in Adults," etc.; reducing the incisors to improve their appearance in crowded arches; misshapen teeth; minor deformities affecting the facial expression corrected by reducing the size of the teeth.

Separation is made between the upper or lower centrals or laterals, and their approximal surfaces are reduced by strips, disks, and occasionally by the use of the diamond disks. The cutting edges of the teeth are leveled by using fine stones. The labial surface should always be higher than the lingual; that is to say, more of the lingual is to be cut away than of the labial. Fan-shaped teeth and uneven cutting edges are thus improved in appearance, and in crowded arches irregularities will be prevented.

This procedure applies particularly to adults, and if room be made in this way, fine silk threads will assist in correcting minor deformities where it is necessary to draw one or two teeth into the arch. Even in young people it will be found valuable as a prophylactic measure where there is a tendency to crowding. The enamel is quite thick at the approximal cutting edges, and if the ground surfaces be polished and afterward kept clean they are less likely to decay when treated in the manner above described. Dr. Payne claims that in fifteen years' practice he has failed to note any injury following this treatment, and believes it to be a benefit to clear out and polish approximal surfaces and, when crowded, to reduce their size. He considers it the only method that thoroughly cleanses the surfaces of the teeth.

Dr. F. L. MARSHALL, Boston, Mass. "The Staple Crown with Porcelain Facing." This is a method of restoring a

front tooth worn away by abrasion without showing gold. The face of the tooth is ground away as much as possible without endangering the pulp. A staple crown is made for the remaining part of the tooth, and a porcelain facing ground to fit where the face has been removed, giving the proper restoration. The facing is soldered to the staple crown and then cemented to the tooth.

Dr. R. H. KEELER, New London. "A Method of Soldering, using Barker's Soldering Furnace." It was claimed that with the use of the Barker furnace or case-heater soldering is reduced to a comparatively easy and safe operation. The furnace, briefly described, has a large blowpipe held in a vertical position by a base on which are located the gas and air valves. Surrounding the blowpipe is a revolving bowl about six inches in diameter, lined with fire-clay and filled with a small piece of pumice-stone. There are two Y connections to the gas and supply pipes to which the hand blowpipe is connected. In soldering an invested case the main object is to keep the investment at a uniform heat, which should be about the temperature of the melting-point of the solder to be used. This is somewhat difficult to do with the old style case-heater, for while you are applying heat to one part of the case, the rest of it is cooling off. With the furnace before mentioned this difficulty is entirely overcome. The case is heated to the proper temperature with the blowpipe in the base of the furnace, and the hand blowpipe is only used in fluxing the solder.

In most cases he uses the solder cut in long, narrow strips, applying it to the part to be soldered after it has reached the proper temperature, using the hand blowpipe to flux it. He thinks this quite an advantage over solder cut in small pieces and applied before the case is heated, as there are no pieces flying off at the wrong moment. He cuts the solder from five-dwt. pieces such as may be obtained at the dental depot, having it well boraxed and burned in, using a pair of tweezers or tongs to feed it to

place. With a little practice one is able to draw the solder along the parts to be united, just leaving enough solder to make a smooth joint.

Dr. M. C. SMITH. "Opening the Bite with Burnished Tips." The method of making the tips is as follows: Grind off the edges of the tooth until you get a clean smooth edge of enamel; then with a sharp drill make from two to four holes, as may be required, as near the enamel as the strength of the tooth will permit, and in any position where you feel there is little likelihood of striking the pulp. Next take a piece of pure gold of whatever thickness you can work best—the beginner would do better to take a piece of platinum. With your thumb press the gold on to the tooth, and you can get a good impression; pick a hole through the gold, and insert the pin, which is made from platinum wire cut to the length desired, and a little head is hammered on. Insert the pin through the gold and press home; the head that you have soldered on will help retain the pin in place. Remove all, place on a piece of charcoal, touch with a minute quantity of borax, add a very small piece of 22-k. solder, and solder together. Return it to the mouth. Now insert another pin and proceed as before. When the pins are all in place, flow a little solder from one pin to the next, so as to stiffen your work; replace the piece on the tooth, and burnish down the edge about one-fourth way around the tooth; remove and flow solder over what you have burnished. After the edge is all stiffened, trim the gold, leaving a little to come over the edge and prevent the solder running over the edge and underneath. Next take a piece of thin 22-k. plate of the right size, punch a hole in the center, and burnish it on to the piece; remove from the mouth, place 20-k. solder over the hole, and draw the solder down from the center, adding more solder at the center each time; continue this process until you have the desired thickness, finishing up with 18-k. or 20-k. solder, so as to give it the desired thickness. These pieces can be ground mostly

out of the mouth, thus saving the patient a great deal of discomfort, and when set with a good cement they wear well.

Another burnished tip that has its place in dentistry is used for centrals and laterals where the teeth have two approximal cavities and perhaps the cutting edge frayed or worn away. Remove the decay, fill with cement, grind the tooth to a wedge shape and across the cutting edge, groove the cement and the tooth a little; then burnish a piece of gold down one side, stiffen with solder, and burnish another side, and so on until the three sides are burnished to a perfect

fit; then add solder or gold plate enough to bring it to the desired size, and after grinding set with cement. For making clasps, burnish a pin of pure gold round the plaster tooth, take a thin piece of clasp metal, and bend it to fit outside the pure gold as near as possible. Put the two together and flow solder between, and you have a clasp that fits.

Dr. LOUIS C. LE ROY, New York, demonstrated the simplicity of the "Construction of Electric Ovens or Furnaces," for the fusing of porcelains, whether for inlays, crowns, bridges, or dentures.

CONNECTICUT STATE DENTAL ASSOCIATION.

Fortieth Annual Session.

(Continued from page 566.)

TUESDAY—*Afternoon Session.*

THE afternoon session was called to order at 2 o'clock by the president.

The next order of business was the reading of a paper by Dr. C. H. GERRISH, Exeter, N. H., on "Why I Use Non-cohesive Gold Foil for Stopping Teeth," as follows:

WHY I USE NON-COHESIVE GOLD FOIL FOR STOPPING TEETH.

Mr. President, and Gentlemen of the Connecticut State Dental Association: I am to give you a talk on a material which is old-fashioned, the use of which does not obtain much at the present day, but which without doubt will be used more by the coming generation. You as a society are celebrating your fortieth anniversary. I am celebrating my fortieth anniversary of practice in dentistry. I began when non-cohesive gold was practically the only material to be obtained, and when the work was all done by hand, and I have followed this line of work for

the simple reason—I don't know whether it obtains now or not—that I can save teeth with it. That is one of the few reasons why I use it still.

The practice of dentistry today is on machine lines, but the lines I work on are those of hand-work, and the results of this work I hope to prove are very acceptable. I have used this material under all conditions. Since I first began, many materials have been brought out from time to time as being valuable for the preservation of the teeth and the salvation of the dentist; they have been tried and found wanting. I come to you with the oldest material used for the preservation of teeth, and when I say that for forty years I have used the same, and had few failures with it, I feel that I know something about non-cohesive gold if I know nothing about anything else. I will not attempt to give you a scientific talk, but a practical one, and directed especially to the young man, who has a future; the older men's habits are set, and I do not try to change them; it would

be useless if I did. So my talk is especially to the younger men of the profession.

After forty years of use of this material I work along the lines of stopping teeth rather than filling them. Anything may fill a cavity, but there are very few materials that will make a perfect stopping. This material will do as good work, and makes a perfect stopping for the present and for the future. Now, a perfect stopping is one that will prevent leakage from either within or without. We stop a bottle to keep the contents from leaking out, and we stop a tooth to keep anything from leaking in. A perfect stopping must be softer than the thing stopped, and a perfect stopping is something absolute; if not absolute it is not perfect. For instance, a rubber tire may be perfect in every respect except that at one place there may be a little puncture, but that one little hole will let the air out, so the tire is not perfect. You may as well have a dozen holes, so far as keeping the air in the tire is concerned. A pair of rubber boots with one little hole lets the water in and fails to serve the purpose; in fact, you had better have a half-dozen holes, then the water will be able to get out, but with one hole it lets the water in and it cannot get out. I have here a bottle of alcohol with a ground-glass stopper; when I put in the stopper and turn it, I can turn to a certain point and no farther. The bottle is stopped, or not; now, you must admit that it cannot be made tighter if it be not stopped at this point.

Here is a bottle containing alcohol, for which I have a cork stopper. I put in this stopper and turn until I know it is tight. If it be not tight I can turn until it is tight, and can always make it tighter; and it is easy to see that this reserve in the cork stopper makes it better for stopping the bottle than the ground-glass stopper which has no reserve. Now, it is this reserve in non-cohesive gold filling which makes it serviceable in saving teeth.

What is non-cohesive gold? It is a foil made into leaves which when pressed together will not stick; they will lie

close together, making a solid soft mass. Now, soft is a term which is applied to both cohesive and non-cohesive gold, and it is this quality which makes it advantageous in our work. The softer the gold is, the more adaptable it is to the cavity. The principle of working non-cohesive gold is the wedging principle. The principle of working cohesive gold is the welding—the sheets lie on each other; but the principle of working non-cohesive is that each pellet stands upright, so that when the filling is finished the surface presents edges rather than flat surfaces. The same condition applies at the base of the cavity.

When there is a defect in this filling material you can continue to force in these pellets until you know that it is absolutely tight, but in the case of the cohesive gold, where the sheets are welded to each other, the little defects are covered up and there is no way of remedying them. The point is that the first piece must not move from its place, and when you put in two, three, or four pieces, they must be parallel to the walls of the cavity so that the last piece makes the keystone of the arch. Now, that filling cannot be moved out of the tooth unless you pull out one of the cones, any more than you can destroy the arch of a bridge unless you pull out one of the stones. If you take one stone out the arch will drop, and this is the structure of the non-cohesive gold filling. Cohesive gold is worked the other way; one piece is put in and the next piece is welded to it, and so on until the last layer covers the entire filling, and the layers are perpendicular to the walls of the cavity from the bottom up. When you get to this point, if your filling be not perfect it can never be made so, but in the case of the non-cohesive, the layers being parallel to the walls, if the filling be not perfect you can by the wedging process make the filling absolutely tight, and you have presenting the edges of the gold, on which the action of the burnisher produces a perfect adaptation. I know that cohesive gold is necessary in a great deal of our work. It is impossible to work without it. It appeals to a great many opera-

tors for this reason: it works itself. That is to say, there is no great amount of skill necessary to keep the pellets in position; after you get one to stay, you can continue. When most young operators fail to make a success with cohesive gold, they order gold that is more cohesive.

Now take the two fillings when finished. With the cohesive gold, the filling is hard; the more cohesive the gold the harder is the filling. When you get the non-cohesive filling in, it is soft. One filling is practically a gold plate, and the other is gold foil. You can take the cohesive gold filling out of the tooth and it is practically a gold ingot; but take the non-cohesive filling out, and it can be picked to pieces. You have not destroyed the qualities of the gold. It is a foil filling when finished. It is like the cork stopper in the bottle; the harder it is pressed upon, the tighter it will get. There is one place in filling a tooth that must be made tight, and that is at the marginal walls. If it be imperfect at that point, your filling is no good; there is a leakage, an opportunity for the bacteria to get in and do their work. With the non-cohesive foil, that is the one locality that you can be absolutely sure of having perfectly tight, and if that one place be tight it does not matter so much about the inside of the cavity; it will keep the bacteria out.

Dr. Miller says that non-cohesive gold has certain germicidal properties; that teeth filled with this material are not so readily attacked by bacteria. And for this reason I claim that it will save teeth longer, and save teeth of a lower grade of structure than will cohesive. It has been my experience in filling children's teeth that I can save them better with this material than with any other. The theory today, however, is that children's teeth will not warrant the use of gold. Gutta-percha or cement is generally used until the children reach the age where the structure of the teeth will warrant the use of gold. From this practice you simply have a waste of tooth-structure; the teeth continue to decay until, when the time comes to fill with gold, you have

an unwarranted display of gold in the mouth.

Another advantage of this material is that you can combine it with cohesive gold. I have made tests within a short time as to the strength of the two when combined. As an extreme test, I have taken a cavity on the grinding surface of a molar and filled it with non-cohesive gold; then I have worked cohesive gold on this, and in testing the attachment of the two I have never been able to separate them. I have been able to pull the soft gold filling out, but a separation between the two I have never been able to obtain.

With regard to its early history: When we consider that non-cohesive gold was used without any modern appliances for keeping the cavity dry, with no dental engines, and none of the conveniences we have today, it is remarkable the results that were obtained. Many times in filling a tooth the filling would become wet two or three times. We would frequently take out the napkin and rest for a few minutes, then dry out the cavity and go on as before. Dr. Shepard at the last meeting of the Harvard Odontological Society showed a tooth which Dr. Howard filled sixty years ago. The tooth was broken, and there seemed to be a kind of amalgamation of the gold and the tooth. The filling had to be scraped from the surface of the tooth, showing a most perfect adaptation to the cavity walls. I have noticed in my own work where I extracted teeth filled with non-cohesive gold, that after breaking them open there seemed to be a kind of amalgamation between the gold and the tooth-structure—showing the adaptability between the tooth-structure and the gold to be absolutely perfect.

One grand test of a perfect filling: A perfect filling is one that you can finish up. Did you ever think of that? Take a poor filling, and the longer the operator works, the worse it looks. If a man makes a poor filling the thing to do is to let it alone. Another test of the two materials is that a poor non-cohesive filling is better than a poor cohesive filling. Take two men who do

not know how to fill teeth with any material, and the man who puts in non-cohesive gold will save more teeth than the man who uses cohesive gold. That shows the merit of the material.

Last summer I had one of my patients in my office, and in looking over her mouth I found fillings that had been there fifteen, twenty, and twenty-five years looking as beautiful as when the work was first done. Last month one of my patients died for whom I had worked thirty-eight years, and she had never lost a tooth, and practically never lost a filling. Gentlemen, I am not egotistic in citing these cases; I am simply zealous in my advocacy of this material. To be sure I had good teeth to start with, but relatively one has the same results in poorer teeth. Difference in the teeth makes a difference in the durability of the work. To give you an idea of the percentage of work that I do, I was looking over my book for the year 1874, and found that during that year I put in six bone fillings, 50 tin, 53 gutta-percha, 118 amalgam, and 671 gold; that made a percentage of seventy-five per cent., which I think is a pretty high percentage of gold work.

Some beautiful workers in cohesive gold get excellent results—save teeth for almost as long as they could with non-cohesive gold. The principal merit of cohesive, however, is in cases where there is practically no tooth to save. The larger the cavity and the more broken down, the nearer the cervical margin under the gum, the longer the cohesive work seems to last. We have in our state many beautiful cohesive-gold operators. I have seen their patients and viewed the results with admiration, but these men are artists, and they know the weakness of the material. In using cohesive gold, if the operator condenses the gold before he gets it to the walls of the cavity, he makes a mistake. An expert in this work does not condense his gold until he gets it to the place where he wants condensation. In the case of non-cohesive gold, if you happen to get the gold in the wrong place you can move it, and have not destroyed the quality of the

gold; but in the use of cohesive, if any pressure is brought to bear before you get it to the place you want it, the filling is of no value.

Dr. Ottolengui, in discussing a paper of mine before the Maine State Society, at Kineo, said, "Why is it, if Dr. Gerish's method of filling teeth is such a panacea, that more dentists are not using this material? I think the percentage that follows his method is about one out of five hundred, possibly less." In answering the discussion I said it was just the question I wanted to have asked me, as it gave me a chance. I said, "Gentlemen, I have not claimed for non-cohesive gold this quality; it won't cure rheumatism and make you a bicycle-rider at the same time, but it will save teeth of a lower grade of structure than will any other material. It is true that the tendency of the times is toward machinery. A machine is a beautiful thing to use, and if you want to make two things exactly alike you can make them better with a machine and more accurate; but if you want to make an ideal thing, there is no machine better than that which God gave you, these three fingers" [indicating the thumb and the first and second fingers].

The dental engine is a mixed blessing to the dentist. It saves time, nerves, and teeth, but in the hands of the ungodly what doesn't it do! Gentlemen, many teeth are cut off and crowned simply because the dentist has not the skill to fill the tooth in the proper manner, and with the engine it is easier to cut off and crown, therefore they are cut off. Now, when you fill a bad tooth and save it for ten years, and then crown it, you have lengthened the life of the tooth the length of time the filling lasts.

If there were no dental engine there would be no dental parlors today. Without it also the dental profession would go back to the old days. Still, it is a great blessing for one who knows how to use it. The rubber dam is another great blessing that we did not have in my day. The great fault of the rubber dam is, that in putting it on several teeth to fill, the teeth will get un-

naturally dry, and you are filling some of the teeth in an unnatural condition. The tooth is thirsting for a drink, and when the rubber dam is taken off that tooth it is going to have a drink. Where does it get that drink from? Not through the apex of the tooth, but from the fluids of the mouth. Gentlemen, keep the tooth wet, but keep the cavity as dry as you can get it.

Another thing I would say to the younger men of the profession: Dentistry offers a great opportunity for the future. I wish to Heaven I were a young man just starting out now! The prospects of the future we cannot prophesy. One thing I would say to the young man: Whatever you do in dentistry, whether cleaning or polishing teeth, making amalgam or gold fillings, do the common things uncommonly well. Let your motto be to make everything perfect. There is no time wasted in preparing your cavities perfectly, especially the marginal walls. Unless you have your cavities perfectly prepared you cannot make a perfect filling.

In my talk I may have seemed egotistic. Gentlemen, I am not; I am simply giving the results of the work of one who knows very little about dentistry, but something of saving teeth with non-cohesive foil. I have done conscientious work in this line for forty years. I have used Abbey's non-cohesive gold foil for forty years, and I have children of patients for four generations come to me and have their work done, and I have not a single regret for having followed this line of work. I have seen teeth beautifully kept for many years with non-cohesive gold, and I cannot say too much to induce you to start this line of work.

Discussion.

Dr. A. J. FLANAGAN, Springfield, In speaking of the relative qualities of gold, Dr. Gerrish forgets that everything in this world is relative; everything is good or bad as one may see it. For instance, the orthodoxy of John Jones may be the heterodoxy of John Smith, with relatively both correct. When many a young man goes out to practice, dentistry

is to his sense something that is seen not in relation to manhood, but to dollars and cents. When a patient goes into the office of Dr. Gerrish it is simply a question, under the honorable methods of Dr. Gerrish, of the salvation of the teeth, and not the size of his pocket-book. Dr. Gerrish practices dentistry from the standpoint of philanthropy, and when a patient comes to him he uses non-cohesive gold simply because he is satisfied that in his hands he can save teeth better with non-cohesive gold than any other material. It is not a question of how much money there is in it for him, but it is a question of the salvation of the teeth. If every man would take non-cohesive gold, or any other material, and practice the same as Dr. Gerrish, he would relatively do as much good as does Dr. Gerrish. The whole question depends entirely upon the man. Dr. Gerrish has been rather modest when he says that it is not the man in his case, but the material which he uses; but it is just the man back of all this.

Dr. Gerrish, without doubt, can do wonders with non-cohesive gold, but he is at odds with the trend of mind on the question of bacteria. He made the statement that if he seals the periphery of the cavity it does not make any difference if there be a space within. I believe that science teaches us that all bacteria may be divided into two classes, aerobic and anaerobic, those that live in air and those that live without air. Now, if Dr. Gerrish be right, science is at fault, because if these germs are pinned into a space and can live without air, we will surely have damage resulting. That is but the one point in the paper that was unscientific, or that might be criticized. He said in the beginning that it was a practical talk because it was unscientific, but I say that nothing can be practical unless it is scientific.

Another question to be considered is that Dr. Gerrish in the saving of teeth practices for people who can afford to pay good fees for his work, and he is able to limit his practice to a certain number each day. The average man who can afford to limit his practice to a certain

number each day can do phenomenal work, while if it be unlimited he cannot do as well, and I doubt if a man with an unlimited practice could do as good work with non-cohesive as with cohesive gold under like conditions.

Dr. JAS. McMANUS, Hartford. I have known Dr. Gerrish for a great many years, and I believe he can back up every statement made here today. Whether a man calls it practical or scientific I do not care, but simply to save teeth is the mission of the dentist, and his mission is to save teeth in the most serviceable manner possible. From the little experience I have had in my life, and in watching the operations of others, I can say that most of the operations that I have ever seen that lasted much over twenty years were non-cohesive gold operations. That is quite a statement to make, but it is true. I have seen Maynard's operations, Harris's operations, and the operations of other men, that were made with soft foil and lasted from twenty to thirty and forty years. I have also seen many first-class operations with cohesive gold that would fail at the vulnerable point, that is the cervical margins; and I believe that more teeth can be saved by operating as Dr. Gerrish operates than in any other way, and saved for a longer time.

With regard to the engine and mallet, I have felt for years that the use of the engine and mallet have both been overdone, and that patients have suffered more than necessary on account of them. I think if more men would educate their fingers, as Dr. Gerrish says, more teeth would be saved and the public would be better off.

Dr. G. M. GRISWOLD, Hartford. I am so heartily in sympathy with the spirit of the paper that I do not want to say anything in opposition to it. I regret to say, however, that my experience with non-cohesive foil has been very limited. Personally, I can build a better and a more substantial filling with cohesive gold than with the non-cohesive. I can say, however, with regard to the lasting qualities of non-cohesive gold, that in my own mouth I have a number

of fillings of this material that were placed there twenty-three years ago, and I hope they will last the limit of thirty-eight years given by Dr. Gerrish. I can, on the other hand, report fillings made by myself that I placed in twenty-two years ago—cohesive gold—with the results excellent up to today.

Dr. S. H. GUILFORD, Philadelphia, Pa. It is very hard to discuss a paper of this kind, or to say anything that may seem to antagonize the views advanced by the essayist when he is evidently such a sincere man and one who thoroughly believes what he says, and yet on the other hand it struck me as a strange contrast that only a few weeks ago, in the city of New York, a paper was read by Dr. C. N. Johnson upon the subject of the preparation of compound cavities in bicuspids and molars and the methods of filling them, which advocated extensive cutting and the combined use of cohesive and non-cohesive foil; whereas in the paper just listened to we are advised to cut sparingly and confine ourselves, in simple cavities, to the use of non-cohesive gold. Dr. Johnson advocated much cutting away of the tooth-structure in order to get the cavity large enough for the operator to work with ease, and also to prevent future decay. The system he advocated would seem to represent one extreme, whereas the paper by Dr. Gerrish represents the other extreme. It may be said that there is nothing in this world absolutely good or absolutely bad. There is something good, and something less good, in every method and every material. Everything that has been said today in regard to non-cohesive gold is largely true, and yet just as much could be said for the use of cohesive gold. One of the previous speakers spoke of having seen fillings done with non-cohesive gold that had lasted from twenty to thirty and forty years, but it should be remembered that these operations came from the hands of masters—Dwinelle and others—who were very skilful operators. We hear only of the successes of these men; the failures have never been mentioned, although there must have been some.

I can easily understand how Dr. Ger-

rish obtains such good results from this material. He has used it carefully and skilfully for many years, and it has served him well. He seems as thoroughly welded to the method as the gold was to the dentin in the case shown by Dr. Shepard.

We must remember, however, in advocating the different methods of operating, that in the teaching of students we cannot teach them how to become expert non-cohesive-gold operators and at the same time expert cohesive-gold manipulators. It is impossible to teach both thoroughly, and the question arises, Which shall we choose? Shall we teach the method that was in vogue forty years ago, when the engine was unknown, when the rubber dam was not in use and cavities could not be kept dry, and when all the conditions were different, or shall we teach them the method which is in most favor at the present time? In this world we are governed in all our actions by the tendency of the times. There is no reason why we should not be wearing buckled shoes, silk stockings, and knee-breeches, for they would probably be as comfortable now as they were seventy-five years ago, but the fashion has changed, and the people have changed in their views. In whatever we do we must needs be governed largely by what those do around us, and the tendency of the times is toward the use of cohesive gold in a limited sense.

The essayist spoke of using non-cohesive gold for the greater portion of the filling, and finishing with cohesive gold in certain cases. Now, it would seem that if non-cohesive gold is good it would be better at the periphery of the filling than anywhere else, and should be used all the way through the operation. Many years ago I had a conversation with Dr. Cushing, celebrated for his perfect operations with non-cohesive gold, and I said to him, "Doctor, do you use nothing but non-cohesive gold?" "By no means," he replied, "I seldom use non-cohesive gold alone. I use it for the greater part of the filling, and finish with cohesive gold."

A long while ago the manufacturers recognized the good features of both

varieties of gold, and began experimenting with the object of producing a gold that would be a compromise between the two, possessing the good qualities of both and discarding the objectionable qualities of each; and there came into existence, as the result of this experimental work, a variety of foil known as semi-cohesive. In ordinary conditions it was non-cohesive, but with the application of a heat it could be made cohesive. I have been using it almost entirely since it was placed upon the market, and I believe it is the best gold for the student to be taught to use in order to produce the best results. Dr. McManus said that twenty years ago the fillings were all of the non-cohesive variety. I do not think that is so, as I find fillings put in twenty-five and thirty years ago that were done with cohesive gold. I am satisfied that the success of the operations depends not so much on the material as upon the operator.

One other point Dr. Gerrish made was that by the use of non-cohesive gold the extreme separation of the teeth was avoided. In other words, that with a limited amount of space you could operate with non-cohesive gold where you could not with cohesive gold. That is certainly true, but at the same time we know that teeth as they present to us are very liable to re-decay at certain points, and that for that reason cavities should be more extended than they have been in the past. If that be done the point made by the essayist will have little weight. We generally try to keep the cavity within reasonable bounds, but at the same time we must extend it sufficiently to guard against future decay—so that working in a limited space will not appeal to many of us.

Undoubtedly, it requires more skill to succeed in the use of non-cohesive gold than with cohesive, and that is why the average student prefers the latter. He feels that he can attain proficiency much more readily with one than with the other.

After all, however, good results are what we are striving for, and the method matters but little.

Dr. JAS. McMANUS, Hartford. I do not want to be misunderstood. It is very well to speak of teeth filled a long time ago, but in speaking of these operations we should go beyond the simple cavities. It is easy enough to put a simple filling in a bicuspid or molar on the occlusal surfaces, but the great necessity for good work is in approximal cavities; and I think we all agree that deep-seated approximal cavities are the most difficult of all cases we have to deal with. There is where I claim that Dr. Gerrish's method is more likely to be lasting and successful. Everybody knows that Dr. Guilford is an exceptionally skilful operator, but there were men in the old days who used soft foil who filled these different and difficult cavities, and filled them successfully with soft foil. They did the same thing with tin foil. I have one case in mind of a filling on the buccal surface of an upper second molar, in which a tin filling put in by Dr. Dwinelle lasted for forty years. It was the man in that case. The tin filling was put in on the same principle that Dr. Gerrish uses with soft foil. When we are looking for lasting operations we should not speak of simple fillings, but fillings on buccal surfaces away down at the cervical margins and approximal fillings between bicuspids and molars.

Dr. E. H. SMITH, Boston, Mass. This is the second time I have had the pleasure of listening to Dr. Gerrish. I liked him the first time, and like him better this time. There is something about his sincerity of manner that I admire. When I was a student the cohesive method of filling teeth was at its height. It was all cohesive gold. I used cohesive gold and nothing else. It was at the time when we were taught to make those wicked little retaining pits. We began by packing the little retaining pit carefully with little bits of cohesive gold, and continued to the end with cohesive gold.

One of the speakers referred to Dr. Gerrish as an extremist in his method of using gold. The extremist does good by fixing the mind on some particular principle. It is for us to extract from these extremists what is best in each case. I

think, however, that the majority of practitioners are conservative in their methods, and use both the cohesive and the non-cohesive varieties of gold. If I understood Dr. Gerrish correctly, I think he said he used both kinds of gold.

Dr. GERRISH. Every day in the week.

Dr. SMITH. When he began to practice there was no such thing as cohesive gold. When the cohesive gold was brought out he used it and has benefited by it, but has not allowed himself to be led astray by it. Now, I think the extreme methods of non-cohesive and cohesive gold have led us to a modification of both methods, and we now use them in combination, with great success.

I want to point out one error in regard to teaching as presented by Professor Guilford, where he claims that the student should be taught one method alone, on the ground that we have not time to teach more than one method. I do not agree with Professor Guilford. To be sure his theory would hold good if it was our purpose to make expert operators in one method only, but to my mind that is not the idea of dental education. The idea should be to make all students competent in all the different operations. We cannot hope to make them as skilful as is Dr. Gerrish with non-cohesive gold, or as expert as Dr. Guilford with cohesive. We should, however, teach the different methods and instill above everything else the principle underlying the saving of teeth.

As Dr. Gerrish says, non-cohesive gold, properly used, saves teeth, and we owe it to our patients to save for them everywhere we can, and non-cohesive gold in skilful hands will not only save teeth, but also the time of the operator and of the patient as well.

Dr. C. B. ERICHSON, New Britain. One thought occurred to me in this matter; that is, that the pith of Dr. Gerrish's paper was that the success in operating was in the man, and not in the material. The success he has had with non-cohesive gold would be likewise with any other man of his ability. It is not so essentially the material as the method of application, the character of preparation

of the cavities, and the thoroughness of the operations.

I have attended dental conventions since 1864, and at every convention I hear the same old story. When I was a young man I would go to conventions, and after hearing a man make his claims for certain materials and methods I would come to the conclusion that he had the right thing, but it did not always work with me, and I soon learned that the secret of the success of any method was the thoroughness of application of the method, and that every man had to do thorough work in order to be successful. At the present time we have two classes of dentists, one class that is making hay while the sun shines, and the other doing business on a conscientious principle, exerting great care to get the best results from the operations in hand; and usually the latter is the man who is most successful in the long run.

Dr. G. A. MAXFIELD, Holyoke, Mass. I am convinced that it requires more skill to use non-cohesive gold than it does for cohesive gold, and it is for this reason that the majority of young men who go to college will use cohesive foil from the beginning. I know that at Harvard the student is taught both methods, but the majority of them will use cohesive gold because it is easier to work. I meet very few students in examinations that use the soft gold. Six weeks ago, at the examination held by our board, we had students from fourteen different colleges, and not one of these students used non-cohesive gold in his practical examination. In filling cavities in central incisors with cohesive foil it necessitates making a large cavity, in order to enter from the bottom and build down. A gentleman—an advocate of cohesive gold—came into my office last Saturday afternoon just as I was preparing a cavity in a right central incisor, and seeing the shape of the cavity, asked how I was going to fill it. I told him I would fill the bulk of the cavity with non-cohesive gold and finish with cohesive, and while we were talking about it I had the tooth filled with non-cohesive gold and finished it with cohesive, and he was astonished at the short

time in which I did the work. I am certain that a good non-cohesive gold filling will preserve a tooth longer than a cohesive gold filling; and besides that, it is not right to make the patient sit under the long strain of a cohesive gold operation when we can do in from fifteen minutes to three-quarters of an hour what would otherwise take over an hour to do. Again I emphasize that it is not best for the operator or the patient to spend the time with cohesive foil when one can do it better and quicker and much easier with non-cohesive foil, although it does require more skill.

There is another thing to be considered in the question of saving the teeth, and that is the question of what Dr. Atkinson would call "retrograde metamorphosis." Some eighteen years ago I had occasion to do a great deal of gold work for a patient. That patient afterward moved to another city in the state, and two years ago last summer this patient went to a friend of mine to have some of the fillings replaced that were coming out. He made the remark at the time of replacing the fillings that if his fillings stayed in for fifteen years he would feel that he had done well. Last summer this patient went back to him with some of these later fillings coming out, and the patient could not understand why those fillings did not stay as well as mine. What was the matter? It was a case of retrograde metamorphosis. Some patients have fillings in their mouths lasting forty and fifty years, and it is because the teeth do not undergo retrograde metamorphosis. Some time ago, in discussing Dr. Black's conclusions in regard to the characteristics of the human teeth, I made the point that there is degeneration taking place in the teeth at certain times of life, and we should take that into account when we are summing up these things.

Dr. GUILFORD. I want to correct an impression gathered by Dr. Smith from my remarks. I did not wish to convey the idea that students should be taught only one method; what I meant to say was that, while we teach the different methods, and have these methods fully explained to our students, we give

particular prominence to one special method. I believe that it is impossible to teach the student to operate by both methods equally well. I was much impressed by a remark made by Professor Truman many years ago. He said that the college course was too short in which to teach men the different methods of operating. The object is to make them as proficient as possible in one method. In my teaching I have taken pains to illustrate and demonstrate the advantages of the different methods as well as I could, believing at the same time that if we take a student from the time he matriculates, and teach him one method thoroughly, he will do better work by that method. We should teach all of the different methods, but give prominence to one special method.

Dr. G. GENESE, Baltimore, Md. I would like to say one word on this question, and that is that the essayist and all the gentlemen answering him have lost sight of one point, viz, that we

should be eclectic. There is no individual method that overbalances all others. We have to get acquainted with the materials we use before we can apply any method successfully. We often see gold coming from the same manufactory differing in its character according to the day on which we are using it. Again, the dexterity of the operator may not be the same on one day as another. A man who has been under a great strain of work in the morning would do well not to work in the afternoon, otherwise he will likely spoil what would under other conditions be a perfect filling.

Dr. GERRISH (closing the discussion). I feel very highly honored for the attention given to me both in the reading of my paper and the discussion of the same. Indeed, I feel that you have given me too much attention. As I said in the beginning of my paper, sink me out of the equation. I take the ground that it is the material, and not the man.

(To be continued.)

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EDITORIAL DEPARTMENT.

THE ST. LOUIS MEETING OF THE N. A. D. F.

At the last annual meeting of the National Association of Dental Faculties, held in Washington, D. C., June 9-11, 1904, a rule was adopted making the standard course of dental instruction four annual sessions of six months each. This ruling was made after a debate characterized by much earnestness upon the part of those who held conflicting views as to the expediency of maintaining the four years' course. The ruling creating a standard curriculum of four annual sessions of seven months each adopted at the Asheville meeting in 1903 had been in effect since that time, and, its results from a financial standpoint having been found unsatisfactory by many of the colleges, opposition to its continuance strongly developed, and a determined effort to return to the three years' standard was therefore made at the Washington meeting in June last. This attempt was unsuccessful and a four years' curriculum with annual sessions of six months each prevailed.

While the sessions had by this action been shortened by one month each, the measure was supported as a compromise measure by many of those favoring a four years' course for the reason that it still made possible the continuance of the four years' curriculum with a longer annual session at the option of the interested institutions, without at the same time placing them at a fatal disadvantage by reason of the competition of shorter course schools. The six months' term was distinctly a concession to certain institutions which represented that for various reasons

they were unable to maintain a longer session, and if compelled to do so would be obliged to withdraw from the association.

The four years' standard with the six months' term was sustained by the narrow majority of three at the Washington meeting, twenty-four colleges voting in its favor and twenty-one against it. Besides the division of sentiment with respect to the number of years, there was an equally marked division of sentiment regarding the length of the annual sessions. This inharmonious state of feeling quickly expressed itself after the Washington meeting in practical and formal terms by the resignation of a considerable number of institutions from the Faculties Association and their announcement of a return to the three years' course.

Fearing the consequences of a sudden disintegration of the Faculties Association, and for their authoritative guidance in this critical stage of the association's affairs, the *Ad interim* Committee, acting with the president, called a special meeting to be held in St. Louis on July 16th for the purpose of deciding upon a course of action. In response to this call twenty-seven colleges were represented by their delegates.

The object of the meeting being as stated—to take such action as would tend to hold the association together—it was developed that about thirty colleges had expressed their dissatisfaction with the existing four years' rule and were prepared to withdraw from membership if its continuance were insisted upon. Hence consideration and debate were directed toward the formulation of a measure which might be satisfactory to all and which would thus prevent the dissolution of the association. After earnest, thoughtful consideration of all the factors of the situation, the following was adopted, with two dissenting votes:

RESOLVED, That the minimum time for dental teaching required by this Association to qualify students for examination for graduation shall be thirty weeks of six days each in each of three separate academic years, exclusive of holidays; this resolution to take effect at once. And be it further

RESOLVED, That all rules or parts of rules in conflict with this resolution be and are hereby repealed.

Two aspects of this matter will doubtless form the basis of criticism. First, that this action upon the part of the association is not legal; second, that the association has authorized a retrograde step in the matter of dental education.

As to the first: If this act of the association is to be judged upon technically legal grounds, then in all fairness we are of the opinion that the action of the St. Louis meeting in making this alteration in the length of the course was clearly done in open disregard of its own constitutional rule, and therefore is illegal. Article IV of the constitution is as follows:

Two-thirds of the colleges belonging to this Association shall be necessary to constitute a quorum.

In all matters not in conflict with article VIII of the constitution a majority of the colleges belonging to this association shall constitute a quorum.

Article VIII is as follows:

Any contemplated change involving the interests of the schools represented, or of this Association, shall require one year's notice before any action is taken.

We hold that this change in the length of the course is a change coming under the provisions of article VIII. Indeed the association so ruled when the motion to change from the three to the four years' course was introduced at Milwaukee in 1901, and has since consistently so ruled on all other subsequent motions modifying the length of course; hence the action of the St. Louis meeting was taken without the constitutional two-thirds necessary to a quorum as provided for in such cases.

On the other hand, no other method of preventing the dissolution of the association seemed possible, and the problem resolves itself into a question of the end justifying the means; and upon the point in question opinions will naturally differ. It is to be borne in mind that the association was confronted with a condition, not a theory; it was practically in a state of siege, and as martial law necessarily differs from civil law, this act of the association, whatever view may be taken of its legality as measured by civil standards, must be conceded to be a war measure and entitled to fair consideration because of that fact.

Regarding the question from the standpoint of the critic who may be inclined to feel that the association has executed something of a Kuropatkin movement by taking a retrograde step in dental education, we would call attention to the figures which represent the working time under the former and present standards respectively. That of the Washington meeting was four annual courses of six months each, which, allowing seventeen days as holidays and a week for examinations each session, would leave a little over five months for actual work each term, or say twenty-two months for the total work of the four years' course. The St. Louis standard provides twenty-one months exclusive of holidays and presumably of examinations, as the actual working time of the three years' curriculum. So that in all cases where minimum standards are the individual maximum standards no serious decrease of working time has been made in the new three years' standard over the old four years' standard. Whether this standard will meet with general acquiescence upon the part of the colleges and accomplish its mission as a harmonizing measure of sufficient force to keep the association intact is for the future to develop.

We are in favor of a four years' course of sessions not less in length than those provided for under the present three years' rule. Evidently professional opinion, at least that of the majority, is not yet sufficiently advanced to practically support a standard of that character—for ultimately it must be sustained by professional opinion as expressed and crystallized in dental legislation. We have heretofore recorded the

opinion that the salvation of higher dental education must come through efficient legislation which will afford practical protection to the institutions which would willingly advance the standards if it were not for the competition for which defective standards of state dental legislation are directly responsible.

The Association of Dental Faculties has demonstrated practically that it is powerless to advance educational standards beyond the limits of existing professional sentiment. Any step beyond that threatens the life of the association, with the inauguration of a cut-throat policy of competition which no school desires to enter upon, simply because no school has the endowment or financial backing to enable it to weather the storm which such a step would initiate. When the dental profession really wants higher dental education, and the consequent elevation of its standards to a plane more in harmony with those of the professions called learned, it may achieve its desire through the enactment of state laws that will specify and safeguard those standards; but not otherwise, unless it will so endow a dental college as to place it above dependence upon the fees of students to meet its running expenses.

BIBLIOGRAPHICAL.

ESSAY ON THE IRREGULARITIES OF THE TEETH, WITH SPECIAL REFERENCE TO A THEORY OF CAUSATION AND THE PRINCIPLES OF PREVENTION AND TREATMENT. By J. SIM WALLACE, D.Sc., M.D., L.D.S. Honorary Surgeon to the West End Hospital for Nervous Diseases, etc. London: The Dental Mfg. Co. (Ltd.), 1904.

The author has been consistent in his endeavor to prove the hypothesis set forth in his introduction—namely, that there is an intimate relation between the size and growth of the tongue and the size and development of the jaws—but it is to be feared that through his interest in his theory he has overlooked many conditions which are with reason conceded to be the cause of undeveloped alveolar processes. For instance, we

know of many cases where the too early loss of a deciduous tooth has been the direct cause of a crowded and undeveloped arch, while the corresponding arch, developing under normal conditions, presented no signs of either of these phases.

We heartily agree with Dr. Wallace in the supposition that the habits and customs of people with regard to their foods may have a positive influence on the formation of the dental arches; and also that the tongue may have an influence in helping to sustain an equilibrium of the forces acting upon the dental arches; but we doubt that an abnormally developed tongue can be considered as the fundamental factor in the causation of contracted arches.

In the chapter on the "General Out-

line of Causation" the author conveys the idea that the tongue is the chief factor in determining the size of the permanent arch, overlooking the generally accepted theory that the eruption of the larger permanent teeth under normal conditions is largely responsible for this result.

The chapter on "Classification" is an attempt to include etiology in the scope of the work. Classification to be of value should present a method of simplifying the treatment of the subject, and at the same time be as comprehensive as possible. Compared with the classification given by Dr. Angle, which is certainly of great value, it would seem that the author had taken a step toward complication, and unless, of course, it be conceded that he has carried his point in relation to the etiology of irregularities his grouping has no value.

As to the "destructive criticism," the author seems to have confined himself to only a small part of the matter pertaining to the subject; and where criticisms have been made, some of them, at least, have not only been severe but uncalled-for, evidently through a misconception of the matter criticized. For instance, on page 140 is found a criticism of anchorage. If this refer to Dr. Angle's treatment of anchorage it does not seem warranted in view of his treatment of the subject as published in the second edition of his work,* as follows:

"Simple anchorage is that in which the resistance of the moving teeth is overcome because of the larger size or more favorable location of the anchor tooth."

"Stationary anchorage is that in which the form of attachment is essentially rigid, so that the tipping of the anchor tooth is impossible, and if moved at all it must be

dragged bodily through the alveolus in an upright position."

"Reciprocal anchorage is the pitting of one malposed tooth against another, the tendency of the force, correctly applied, being to move both into the line of occlusion."

The rational interpretation of the foregoing would not seem to justify the following criticism taken from Mr. Wallace's essay: "The study of the irregularities of the teeth is a serious subject, but fortunately writers on the treatment have introduced words and ideas which infuse a considerable amount of amusement." Then follows his interpretation of the meaning of the various kinds of anchorage, such as "simple," "stationary," and "reciprocal." This divergence from the generally accepted idea of these terms would seem to be the only amusing feature.

The chapters on "Prevention" and "Treatment" are in keeping with the central idea of the essay.

The book is to be commended, inasmuch as the author has a just realization of the importance that etiology should assume in the treatment of the subject. It is a relief to see that more thoughtful dentists are at work to make plain the causes of irregularities, instead of giving their entire attention to their correction.

S. M. W.

"GUIDE PRATIQUE ET FORMULAIRE POUR LES MALADIES DE LA BOUCHE ET DES DENTS," ETC.

PRACTICAL GUIDE AND FORMULARY FOR THE DISEASES OF THE MOUTH AND TEETH. By G. VIAU, Chirurgien-Dentiste de la Faculté de Médecine de Paris, Professeur à l'École Dentaire de Paris. Paris: F. R. de Rudeval, 1904.

On examination, this "guide" turns out to be in reality an extensive treatise on dental therapeutics, embracing

* "Treatment of Malocclusion of the Teeth and Fractures of the Mandible."

as it does the local and systemic treatment of every possible disorder within the sphere of odontology. Throughout its pages the reader will find numerous and valuable suggestions on the treatment of the simpler as well as of the most refractory of diseases coming under the supervision of the dentist. The work is the outcome of years of observation in the special field of stomatology, and embodies the author's original methods of treatment together with those of other practitioners whose names are household words among dentists.

It has been the reviewer's experience that a considerable proportion of dental students and a number of practitioners of dentistry are prone to look upon materia medica and therapeutics as purely decorative branches of the dental curriculum, completely losing sight, apparently, of the fact that without their indispensable aid dentistry would perforce lose its right to a place among the specialties of the healing art, and its usefulness to mankind would become most

insignificant, to say the least. Those beautiful crown and bridge work restorations which have done so much toward the comfort and healing of dental sufferers would be of course out of the question, and in one word the influence of the dentist would then be restricted to the extraction of teeth which otherwise could have been saved, and their substitution by means of cumbersome plates uncomfortable to the wearer, particularly in cases where the teeth to be replaced are few.

The work under consideration typifies the possibilities of rational dental therapeutics, and suggests methods for the salvation of teeth which even today are sacrificed to the forceps. It is regrettable that the language in which it is written will limit its usefulness to very few among English-speaking dentists, but, from the fact that the book is replete with formulæ and prescriptions, its perusal would prove beneficial even to those unfamiliar with the language of the author.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

[*La Revue de Stomatologie*, Paris, May 1904.]
 APHTHOUS LARYNGITIS A COMPLICATION OF APHTHOUS STOMATITIS. BY
 M. K. ZUPPINGER.

The author reports (*Wiener klinische Wochenschrift*) six cases of aphthous laryngitis in young children consecutive upon attacks of aphthous stomatitis. Coughing similar to that accompanying false croup, and dyspnea which at times was of intense severity, were the symptoms showing that the buccal inflammation had spread to the laryngeal structures. Laryngoscopic examinations were difficult to make, and while all the physical signs could not be perceived, yet it could be clearly seen

that the margins of the epiglottis and the aryteno-epiglottic folds were highly inflamed, tumefied, and covered with aphthous patches. The treatment consisted in inhalation of hot vapors, the application of hot compresses upon the neck, and irrigations of the mouth and pharynx with solutions of potassium permanganate. All the patients recovered.

[*Dental Brief*, Philadelphia, July 1904.]
 SOME THINGS TO REMEMBER. BY L. P.
 HASKELL, CHICAGO, ILL.

In this interesting little article the author calls attention to several points which ought to prove valuable to everyone concerned in

the making of prosthetic appliances. Dr. Haskell says that in order to bring out all the good qualities of Babbitt metal the formula of the alloy should consist of—Copper one part, antimony ten parts, tin eight parts. Much of the ordinary Babbitt metal of commerce contains some lead, which ruins it for dental dies. Pure lead cannot be poured upon a proper Babbitt metal. The melting-point should be reduced by the addition of one-sixth part tin, and should not be poured as it comes from the heater, but should be stirred until it begins to attach itself to the sides of the ladle.

Regarding the swaging of aluminum, we find that to prevent the tearing of the metal in undercut spaces the author suggests the cutting out of the corresponding places in the counter-die.

In swaging gold or platinum, and to facilitate the work, slitting of the front and lapping is here recommended by Dr. Haskell, inasmuch as not only can there be no possible objection to this procedure, but on the contrary it is a real advantage, in that it strengthens the weakest point of the plate. The paper also contains suggestions as to the making of wire clamps for holding together pieces of metal to be soldered, or for any other purpose, and on the making of rubber plates when restoration of the canine eminences is indicated.

[*Transactions of the Odontological Society of Great Britain*, London, March 1904.]

ON ELECTRIC STERILIZATION OF ROOT-CANALS. BY W. D. MILLER, BERLIN.

After reviewing the literature of the subject, the author describes the experiments of Dr. Hoffendahl on the sterilization of root-canals by means of an electric current. A number of teeth in which the ordinary methods of treatment had utterly failed were subjected to the electric current with most satisfactory results, inasmuch as the inflammation subsided and the suppuration was arrested after two or three treatments. In view of the results of Dr. Hoffendahl's experiments Professor Miller decided to investigate the matter closely, and it is the result of his work that we now desire to record.

The experiments consisted in extracting putrid teeth, and in passing through the canals an electric current of $1\frac{1}{2}$ to 2 milliampères during ten minutes, and in order to bring about conditions resembling those in the mouth he took the head of a calf, spread the jaws open, and implanted a tooth containing a putrid pulp in the anterior part of the upper

jaw. The positive pole of the battery was inserted in the root-canal and the negative applied to the anterior part of the lower jaw. This gave a current passing through the whole head of the calf. In nearly all cases the bacteria were completely destroyed by the current of $1\frac{1}{2}$ to 2 milliampères passing through the root-canal for a space of ten minutes. After five minutes the number was materially reduced, and after ten minutes there were no living bacteria to be found. Experimenting with the staphylococcus pyogenes aureus gave the same good results.

Dr. Miller then devised an ingenious little apparatus to determine whether the electric current would have the effect of sterilizing the contents of abscesses, and by means of it found that with a current of $\frac{1}{2}$ to 2 milliampères the bacteria were reduced to one-fifth of the original number in about thirty minutes' time. The micro-organism experimented with in this case was *B. prodigiosus*. As the infected area was saturated with a sodium chlorid solution the author is of the opinion that the sterilizing action is due to the products resulting from the electrolytic action, and in this particular case to the effect of the liberated chlorin upon the offending micro-organisms.

The results of the experiments of Professor Miller confirm those obtained by Brauer and Lieber, and show beyond a doubt that it is possible to diminish, if not completely destroy, bacteria by the use of the electric current.

Further experiments will be conducted along these lines, and if results attained are found to be as favorable as in the previous instances a method of so much promise should certainly be tried by as many practitioners as possible, in view of the wide range of applicability of what would seem to be the acme of perfection in root-canal therapeutics.

[*l'Odontologie*, Paris, June 15, 1904.]

STOVAIN: A NEW LOCAL ANESTHETIC. BY DR. CHAPUT.

A critical analysis of the physical, chemical, and physiological properties of this new compound appeared originally in the issue of *l'Odontologie* for April 30th, in which the author of the article, Professor Sauvez of the École Dentaire, reported in detail the results of some experiments made by him with what would seem to be an ideal agent.

The new anesthetic is derived from tertiary amylic alcohol, and is chemically speaking a hydrochlorid of amylein AB, according to the nomenclature advocated by Ladenburg. The

toxicity of this agent is extremely weak as compared with that of cocain. It has no vaso-constrictor action, the capital objection to cocain; stovain has, indeed, a tendency to dilate rather than to contract the caliber of bloodvessels.

After experimenting upon animals, Dr. Sauvez administered it to patients, and by its means has since performed satisfactorily a number of extractions, using solutions of 0.75 per cent. strength. The degree of anesthesia thus obtained was amply sufficient to carry out the operations painlessly, and in no case were any unfavorable symptoms observed.

Further experiments have been carried on by Dr. Chaput, who finds that solutions of 1:200 produce a degree of anesthesia as intense as that which may be obtained with cocain solutions. Being a vaso-dilator it maintains vascular fulness in the medulla oblongata, prevents the occurrence of syncope, and allows the carrying out of the operation with the patient in the sitting position. Alone or in combination with cocain its employment in spinal anesthesia has given entire satisfaction, and under its influence such extensive and difficult operations as laparotomies have been successfully performed, herein again indicating its superiority to cocain.

[*Le Monde Dentaire*, Paris, May 1904.]

BUCCAL ANTISEPSIS. BY DR. E. DUNOGIER, BORDEAUX, FRANCE.

In a previous paper on the "Prophylaxis of Tuberculosis and Other Infectious Diseases," read by the author before the Academy of Medicine of Paris, special attention was directed to the dangerous systemic results accompanying purulent conditions about the oral cavity, and more particularly in reference to the propagation of infectious diseases and the occurrence of serious complications in the course of certain maladies which would not have acquired a malignant type had the mouth been properly cared for.

In that paper the author discussed the cachectic state induced by pyorrhea alveolaris and other purulent mouth-conditions, and referred to the healthy transformation observed in patients so affected immediately upon the eradication of the suppurative condition. The observations recorded by Dr. Dunogier have been since confirmed by Hunter, Tellier, Sabatier, Ferrier, and Galippe.

Dr. Sabatier in his paper on "Septicemiæ of Buco-Dental Origin" very explicitly states that suppurations of the gingivo-dental region may give rise to microbic complications of the

septicemic type. Patients thus affected complain of feverishness, alternating attacks of diarrhea and constipation, and night-sweats. The urine shows traces of albumin, and the complexion acquires a sub-icteric tinge. They seldom think of their mouth-conditions, and seek medical advice only on account of their extreme weakness, loss in weight, and digestive troubles.

To emphasize the part which mouth-infection plays in the production or aggravation of certain systemic disorders the author describes an interesting case originally reported by Drs. Ferrier and Galippe. It was that of a young man aged twenty-one, who had been a sufferer from albuminuria for over six years. During all this time his mouth had been the seat of suppurative processes, owing to his total disregard of dental cleanliness. With considerable difficulty he was made to appreciate the necessity of brushing his teeth and otherwise attending to the care of his mouth. The new regimen soon showed its good effects by causing the entire disappearance of the albumin in the urine. Shortly after, in order to ascertain positively whether the mouth-infection had been directly concerned in the causation of the albuminuria, the patient was directed to abandon temporarily all dental care. This was followed five days afterward by the reappearance of albumin, and thus the original diagnosis was definitely established.

Another interesting case was that of a diabetic with a marked pyorrheal condition, in whose urine the percentage of sugar decreased as the mouth-condition improved.

In this connection it may be likewise interesting to relate the case of a patient who consulted the reviewer for what appeared to be a chronic pharyngitis. The oral mucous membrane, which was slightly inflamed, and the presence of other physical signs, led to the reasonable supposition that the pharyngeal condition was being kept up by a mild oral infection. A course of treatment was instituted on this basis, consisting of a thorough daily cleansing of the teeth with an antiseptic dentifrice and mouth-irrigations with the following solution:

R—Hydrogen dioxid	.....	5j;
Listerine	.....	5j;
Distilled water	.....	5iv. M.

Sig.—Use thrice daily in full strength.

The pharyngeal mucous membrane soon regained its normal tone, and all signs of inflammation disappeared.

PERISCOPE.

Sealing a Cavity with Cotton and Sandarac.—Cotton soaked in sandarac, if left in a cavity for several days, becomes very foul. If oil of cinnamon be added to the sandarac it will be found much less objectionable.—HOMER ALMON, *Dental Review*.

Neuralgia due to Dental Irritation.—Lederer reviews the various diseased conditions of the teeth that are capable of giving rise to neuralgia. He reports one case of cervico-brachial neuralgia which was due to a pulpitis of the lower second molar.—*New York Med. Journal*.

A Non-flammable Celluloid.—A celluloid which takes fire with great difficulty may be prepared by mixing a suitable quantity of one of the alkyl esters of silicic acid, such as amyl or ethyl silicate, with the nitro-cellulose and camphor solution. A French patent has been taken out to protect this combination.—*Chemist and Druggist*.

A Wise Precaution in Operations under Local Anesthesia.—Do not let your patients see an operation that you are doing upon them under local anesthesia, and then ascribe their fainting to the cocain. Remember also that men, however strong they may look, are more apt to faint at the sight of blood than are women.—*Internat. Journ. of Surgery*.

Operation for Congenital Saddle-Nose by the Introduction of a Celluloid Plate.—Wiener (*Medical Record*, New York, April 16, 1904) reports a case of saddle-nose in which he dissected up the skin and introduced a celluloid plate molded to the proper shape. There was some redness and swelling for the space of ten days, but the ultimate result was so satisfactory that he recommends the procedure for trial.—W. E. M., *Cincinnati Lancet-Clinic*.

The Necessity for Supplementary Measures after Removal of Adenoids.—Friberg (*Arch. of Pediatrics*, April 1904) calls our attention to the lack of supplementary treatment following operations for adenoids. To this carelessness on the part of the profession are due the poor results obtained from this operation. The removal of the adenoids does away with the obstruction, but the nasal breathing can only be established by the

proper training of the child. After nasal breathing is established during the waking hours, the mouth-breathing will not exist during sleep. He advocates the encouragement of the gum-chewing habit for a time, as this will assist in keeping the mouth closed. He also recommends a wooden splint to keep the mouth shut during sleep. The second step of the treatment is directed to the proper correction of any dental deformity which may exist.—W. E. M., *Cincinnati Lancet-Clinic*.

Fetid Breath.

R—Infusion sage,	250 gm
Glycerin (pure),	30 "
Tinct. myrrh,	
Tinct. lavender, of each	12 "
Labarraque's solution,	30 " M.

Sig.—Mouth-wash, as required.

When due to gastric fermentation, wood charcoal in dose of 10 grains every three hours.—*Monthly Cyclopedia of Pract. Medicine*.

Stovain.—De Lapersonne states that this anesthetic is an amylene chlorhydrate, two and one-half times less toxic than cocain, disagreeable upon first application to the cornea, but valuable in eye operations, except in iridectomy and when repeated anesthesia is required for tenontectomy. In subcutaneous and subconjunctival injections it seems to be superior to cocain. The writer recommends the use of one drug after the other.—*New York Med. Journal*.

Restoring Mouth Injured by Air-Chambers.—When the roof of the mouth had been ruined by having the tissues drawn down. Dr. Atkinson made a rubber plate to accurately fit the parts. The hypertrophied parts were painted with a saturated solution of salicylic acid in alcohol. That was done once daily for three or four days; then some plaster was put in the plate, and the plate put in the mouth. That was continued from time to time, the plaster cores being changed at each setting, increasing in thickness until the roof of the mouth was gradually reduced to its proper condition. I remember one case he showed me where he had reduced nearly half an inch of hypertrophied tissue by that means in the course of a few weeks.—R. OTTOLENGUI, *Items of Interest*.

Non-Syphilitic Perforation of Septum.

—Felix notes the importance of understanding all causes of perforation, because specific treatment might be begun and continued for years without benefit. Among other causes are—Simple ulcer, which never attacks bone; occupation ulcerations—occurring in workers in cement, in chromium salts, alizarin, or Swedish matches—which may involve bone. Perforation is common also in cobalt miners and wherever arsenic is used in manufacturing; also in factories of glass, paper, dextrin, sodium carbonate, and hydrochloric acid. Other causes are atrophic rhinitis, traumatism, perichondritis, and foreign bodies. Perforation may also complicate typhoid fever, diphtheria, smallpox, tuberculosis, lupus, leprosy, glanders, rhinoscleroma, sarcoma, adenoids, dental cyst, Bright's disease, and tabes dorsalis. Other proof than mere perforation is therefore required to establish a diagnosis of syphilis.—*New York Med. Journal.*

Ankylosis of the Mandible: Operative Treatment.

—Kusnetski (*Centralblatt für Chirurgie*) reports two cases of ankylosis of the mandible in which he removed a section of bone one centimeter in length from the middle of the ascending ramus and implanted a muscular flap from the masseter muscle between the ends of the resected bone. The first patient was a seven-year-old child in whom ankylosis developed four years previously, after an attack of scarlet fever and otitis media; the second patient was a woman thirty years old in whom the ankylosis developed after an attack of typhoid fever, complicated by inflammation of the joint twenty years previously. After operation the child could open his mouth to an extent of 1.75 centimeters, and the woman to 2.5 centimeters. These two cases, taken in conjunction with ten reported by Schmidt, prove the usefulness of this method.—*Therapeutic Gazette.*

Electric Terms in Current Use.—Electricity has a scale of measurement that it is well to understand. The basis of this scale is the volt, which is the unit of electro-motive force—that is to say, the force by which the electricity is driven; then comes the ohm, or the amount of resistance offered; then the ampère, or the unit of power required to overcome the resistance. For instance, it takes a one-pound hammer with a one-pound blow to penetrate a given substance, but a substance offering twice that resistance would require with the one-pound hammer greater pressure to penetrate in proportion to the resistance

offered. So if we have one volt, and a resistance offered of one ohm, we would multiply the number of volts by the number of ohms and have the power of the ampère, which in this case is one. The term "ampère" is usually expressed as ampère hour, or the amount of current used to overcome a given amount of resistance for one hour. The voltage multiplied by the ampère gives us what is called the watt; for instance, the current is ten volts, and the device offering one ohm resistance would be $10 \times 1 = 10$ ampères in consumption. Then the number of watts used would be the voltage, 10, multiplied by the ampère, 10, or 100 watts. One thousand watts is termed a kilowatt. The watt, like the ampère, is usually expressed by the adding of the word "hour," as one watt hour, etc. The terms used in the measurement of electricity are well to know and to learn, and while no doubt confusing at first, will soon be as readily understood as the grain, ounce, and pound.—HARRY M. HILL, *Dental Era.*

Mandibular Infection through a Deciduous Tooth.

—Only today a boy of four was brought to me suffering from a necrosis of the right half of the lower maxilla the result of an infection from the first deciduous molar. This is only one instance of many cases that are due to the want of a little knowledge on the part of the mother as to the importance of preserving the deciduous teeth. When you ask them why they do not take better care of their children's teeth they answer, "Why, what is the use of caring for these baby teeth? They will get better teeth later." The statistics brought out at the meeting at Madrid last April showed that ninety-four per cent. of all the children in the public schools of Germany are suffering from diseased teeth, and of this ninety-four per cent. many have serious complications which have arisen from the infection carried from these teeth into other parts of the body.—TRUMAN W. BROPHY, *Dental Review.*

Contouring Approximal Surfaces.—As a guide to the form which should be given fillings on their approximal surfaces it is well to study somewhat closely the natural form of the teeth previous to decay. If this be done it will be found that the actual area in contact between normally formed human teeth is exceedingly small, and when we look into the philosophy of this we shall see that there is an excellent reason for it. The food of man is diversified, and certain varieties of it are fibrous in nature. In the mastication of this fibrous food it is inevitable that occasionally some of the fibers will be forced

between the approximal surfaces of the teeth, and if the contact be broad the fibers will be retained, to cause discomfort to the patient and induce decay in the approximal surfaces. It is precisely this which occurs when flat surfaces are left to fillings, and many cases of recurrent caries around fillings otherwise perfect may be traced to this.—C. N. JOHNSON.

Diagnosis of Frontal Sinus Osteoma by the X Rays.—

The difficulties attendant upon the diagnosis of this condition ought to be simplified by the employment of the Roentgen rays, but thus far no skiagraphs of the lesion have been published. G. Perthes (*Archiv f. klin. Chir.*, vol. lxxii, No. 4) reports a case where the X rays proved to be of the greatest importance, both as regards the diagnosis and the determination of the site of operation. By the removal of the growth, the malposition of the left eye was corrected and the headaches and other symptoms disappeared. Without the rays it would have been impossible to recognize the presence of the bony tumor on the roof of the orbit which was displacing the bulb. No elevation could be detected on the forehead, and the tumor might as well have been exostosis. The skiagraph taken in two planes showed that the growth extended 4 cm. above the roof of the orbit and beyond the median line to the other side.—*Medical News*.

The Germ of Syphilis.—Horand states that in 1902 he discovered in the blood of a syphilitic infant germs like a small eel, endowed with a spermatozoid movement, moving rapidly about the microscopic field, and adhering to them highly refractive circular bodies. No description of these bodies was to be found in syphilitic literature, and Horand pursued his investigations alone for some time. He details his method of mounting blood for the purpose of finding this germ, which was evidently not a bacillus, a sporulated capsule, or a trypanosoma. Horand has found it near the primitive chancre, and watched its evolution in the blood and lymphatic vessels, in mucous plaques, and in secondary and tertiary ulcerations. It is found in both sexes. Horand states positively that he can make an absolute diagnosis of syphilis by examination of the blood, and believes that he has discovered a hitherto undescribed parasite of intraglobular evolutive form, a sporozoön, a protozoön, or best a hemoprotist, which can always be found near the characteristic lesions of syphilis and, in a characteristic form, in the blood of syphilitics.—*New York Med. Journal*.

Chancre of the Tonsil.—The apparent infrequency of chancre of the tonsil, and the small number of cases—two, if I am correctly informed, being recorded in Cincinnati—justify, I consider, the report of the following case: Mr. S., grocer's clerk, consulted me on January 7, 1903, for a sore throat. He had had a chill, general aching, and painful deglutition. Upon examination his temperature was 102°, and the left tonsil presented the appearance of acute follicular tonsillitis. Within a few days the pain and swelling subsided, but the submaxillary gland of that side became enlarged and indurated. My suspicions becoming aroused, I then made a more careful examination, and by pulling the tonsil forward discovered on its posterior surface a small, well-defined chancre. This diagnosis was subsequently confirmed by the appearance of a roseola and the development of an iritis, with posterior synechiae in the left eye. Mr. S. denied positively that he had been exposed to any possibility of contagion for more than a year.—R. C. JONES, *Cincinnati Lancet-Clinic*.

Soldering with Electricity.—The author had recently to repair a denture of gold through which an opposing molar had worn a hole. As one knows, ordinarily this would mean the removing of the teeth, as they were attached to the plate by vulcanite, involving a great deal of work and some elements of risk. I repaired this plate by attaching to it the negative wire of the lighting circuit, and to the positive wire a small carbon, cutting in, in series, a bowl of salt water as a rheostat. The hole in the plate was cleaned and prepared in the usual way, then covered with a piece of foil and 18-k. solder placed on it, and borax for the flux. The carbon point was brought in contact with the solder and then gradually removed, forming the arc, which was held sufficiently long to melt the solder. The hole was closed thereby, and the rubber, hardly an eighth of an inch away, was uninjured; and by immediately immersing the plate in water it did not allow the heat to spread to the surrounding parts. While this case is one that is not common, yet it is well to know that repairs of this kind can be made without going through the laborious operation of taking the bite, etc. The melting of any of the metals—and even of platinum scrap—can be accomplished in the same manner. I have soldered teeth in this way successfully, and know that with proper care soldering in many cases can be done with electricity.—HARRY M. HILL, *Dental Era*.

The Advantages and Disadvantages of Porcelain Inlays.—Some of the advantages of porcelain inlays are as follows: Fillings can be inserted which only the expert can detect. They are non-conductors of thermal changes. The margins of cavities filled with porcelain are not readily attacked by caries. The patient is relieved of the excruciating pain of adjusting rubber-dam clamps for cavities extending beneath the gum. Nervous strain on both patient and dentist is lessened. Porcelain gives a better masticating surface than metal. Busy patients need not spend so much time in the dental chair.

The disadvantages of porcelain are: The friability of porcelain causes it to fracture readily. It is impossible to bevel the cavity margins to protect the enamel. It is difficult to match the color of the natural teeth. The cement used as a retaining medium may cause a change of color in the tooth or inlay. The cement will be dissolved unless there is only a thin film used as a retaining medium.—J. Q. BYRAM, *Dental Summary*.

Salivation in Nasal Obstruction.—Rugani produced artificial nasal obstruction in a dog by curetting the nasal mucosa on the right side, and by suturing the right nostril. The dog was kept under the influence of morphin in order to prevent it from forcibly destroying the obstruction. The adhesion of the walls was incomplete, but a few days after the operation an abundant salivation appeared, together with congestion of the conjunctiva, and lacrymation; this salivation continued with slight diminution until the death of the animal. The experiment is of interest on account of the observation of a number of rhinologists, that there is an increase of saliva in patients with nasal obstruc-

tion in the shape of hypertrophic rhinitis, adenoids, etc. In the present experiment the salivation was probably reflex, due to irritation of the mucosa, through the presence of cicatrices and granulations affecting the terminals of the trigeminus. From these, through its branches to the facial nerves and from the latter to the corda tympani, the irritation affected the salivary secretion.—*New York Med. Journal*.

Wholesome Influence of Professional Societies.—Difference of opinion must arise in connection with our science, and the practical application of the knowledge and skill acquired by the study of experienced men must also vary almost indefinitely. And since neither knowledge nor skill is the monopoly of any one man, it follows that the common center for focusing, collecting, sifting, and diffusing the adequate wisdom of a part or of the whole body becomes an indispensable factor, and the uppermost factor, of our profession—and he who fails to recognize his obligation in this direction must certainly fall short of his duty to his clients, his profession, and himself. For the cultivation of the social principle, local societies afford ample opportunities, and by this means are effective promoters of the common weal. Social gatherings of this sort are the most potent antidotes to those small human weaknesses which manifest themselves in petty jealousy and local rivalry, by creating a firmer bond of union between the members, and by fostering more cordial sympathy between them. The greater the advancement of the entire body of which we are members, the more earnest and determined the resistance to all that would degrade and defile us.—R. EDWARDS, *Dental Record*.

HINTS, QUERIES, AND COMMENTS.

A METHOD FOR MORE ACCURATELY PLACING CLASPS ON A RUBBER DENTURE.

AFTER the teeth have been ground and articulated, the plaster tooth to be clasped is broken off at the gum line and replaced with a very thin film of wax. The clasp, having been previously fitted, is cemented to the plaster tooth and the case flaked. In

separating after boiling, the plaster tooth and clasp come away with the plate teeth, and the spur of the clasp is then packed the same as the pins.

Enough time should elapse between the cementing of the clasp and the boiling out to allow the cement to thoroughly set.

J. ARTHUR STANDEN.

Philadelphia, Pa.

OBITUARY.

DR. JOHN COLLINS PAYNTER.

DIED, at his home in Philadelphia, on May 13, 1904, Dr. JOHN COLLINS PAYNTER.

Dr. Paynter was born on a farm in the neighborhood of Newcastle, Del., February 6, 1820. After many years devoted to several pursuits in business, mechanical, and architectural lines he took up dentistry, and entered the office of Dr. Bassett in 1878. His previous training had developed to an unusual extent his natural mechanical skill, and therefore soon after he entered upon the study of dentistry he was able to master the most intricate problems of prosthetic dentistry. He practiced in Philadelphia for many years on Girard ave., and afterward removed to Seventeenth st.

In 1867 Dr. Paynter was married to Georgetta League of Baltimore, who with four sons and two daughters survives him.

June 7, 1904, passed the following resolutions on the death of Dr. Jonathan Taft of Ann Arbor, Mich.:

Whereas, In the death of Dr. Jonathan Taft, whose death occurred at Ann Arbor, Michigan, October 15, 1903, the dental profession has lost a most valuable member, one who gave generously of his knowledge for the advancement of his ideals—a noble manhood, ideal operations, and faithful services; a man, unselfish, gifted, kind, and true, using his God-given talents for a noble purpose—serving man; and one whose fidelity and Christian character must ever be an example to the coming generations of an ideal dentist; therefore be it

RESOLVED, That we, his followers and members of the Northern Ohio Dental Association, in annual convention assembled at Cleveland, June 7, 1904, express and record our appreciation of his noble life and generous contributions to the dental profession, and urge upon every member to live the life this gifted man lived, in order to bring to pass his conception of an ideal dental profession.

C. R. BUTLER.

CORYDON PALMER.

F. S. WHITSLAR.

Committee.

"IN MEMORIAM" RESOLUTIONS.

Dr. Jonathan Taft.

THE Northern Ohio Dental Association, at a regular meeting held at Cleveland, Ohio, on



The Coliseum Building, St. Louis,

WHERE THE FOURTH INTERNATIONAL DENTAL CONGRESS WILL BE HELD.

Fourth International Dental Congress.

GENERAL INFORMATION.

THE Fourth International Dental Congress to be held in St. Louis, August 29th to September 3d, inclusive, 1904, will convene in the Coliseum, a building most favorably adapted to the holding of such a gathering and possessing accommodations so ample that all of the features of the Congress will be held under one roof and without interference one with another. This great structure occupies two blocks between Olive and St. Charles, and Thirteenth and Fourteenth sts.; it covers an area of nearly four acres, with a floor space for exposition purposes of 300,000 square feet.

The Coliseum is one of the largest and most commodious convention halls ever built, and is practically fireproof. It contains a large theater capable of seating 2500 people, which will be used for the general sessions of the Congress, and ten additional meeting-rooms, furnishing ample accommodations for the simultaneous meeting of the ten sectional divisions of the Congress; a large hall for exhibits, covering 9000 square feet of floor space, practically all of which has been taken by intending exhibitors; and a well-lighted gallery for clinics, capable of accommodating the one hundred chairs which have been provided for that purpose. In addition to the foregoing, numerous committee-rooms and telegraph, telephone, and postal facilities will be provided in the building, and it is expected also that a well-ordered café will be in operation during the time of the Congress.

In connection with the building, and under the same roof, is the Coliseum

proper, where 19,000 persons may be comfortably seated, exclusive of the stage, and it is anticipated that this audience-room will be used for one of the social features of the Congress, constituting an entertainment unique of its kind.

Besides the advantages of its ample accommodations for the Dental Congress, the Coliseum building has the advantage of being located in the heart of the business section of St. Louis, and at considerable distance from the Exposition, so that the meetings will be less disturbed by the diverting attractions of the great Exposition than if the Congress were held within the Exposition grounds.

Accommodations.

The Local Committee of Arrangements has selected the Hotel Jefferson as the general headquarters of the Dental Congress. This is one of the most fashionable and complete hotels in the United States, and is located on Twelfth st., one block from the Coliseum. In addition to the Hotel Jefferson as headquarters, the hotel accommodations of St. Louis will be sufficient to meet all requirements. The Information Bureau of the Exposition has a list of ninety-seven well-established hotels in St. Louis with a capacity of 41,000 guests at prices ranging from fifty cents a day upward on the European plan, and from one dollar a day upward on the American plan. These established hotels have been supplemented during the year 1903 by thirty-five new permanent hotels, increasing the permanent hotel capacity to

67,000 guests, at prices ranging from one dollar a day upward. The Exposition management holds the signed agreement of the leading hotels that "rates shall not be increased during the World's Fair period." Prices are now lower in St. Louis than in any other city for similar hotel accommodations and service.

The Exposition Information Bureau's list of 132 permanent hotels includes only those of the better class. There are now 173 hotels, large and small, in operation in the city, and the new hotel enterprises being inaugurated justify the belief that the number will reach 250.

Besides hotels with accommodations for more than 200,000 guests, the Exposition Information Bureau has a list of boarding-houses and rooming-houses of a respectable character on the street-car lines with lodgings for 65,000 guests, and a list of private houses that will let rooms for 20,000 persons. All over the city permanent houses and rooming-houses are available to those who prefer rooms away from the crowds, with meals at the restaurants. There are 485 restaurants in St. Louis that have a national reputation for good fare, good service, cleanliness, and moderate prices; twenty of these 485 restaurants can take care of 40,000 patrons.

Cost of Living during the Fourth International Dental Congress.

The Local Committee and Bureau of Information, wishing to dispel from the minds of the profession, and of all persons laboring under such misconception, the idea that the rates of St. Louis hotels are extortionate, have issued the following bulletin:

We have investigated the conditions and rates of the leading hotels of St. Louis, and notwithstanding the fact that this city is entertaining a World's Fair, the hotel rates are no higher than in other cities.

We append a number of the leading hotels and rates of the same, and call your attention to the fact that it is not requisite to put up at any of the hotels mentioned, as there are

many hotels and boarding-houses in the city where rooms can be secured for from 50 cents to \$2 per day. (The exact date should be stated in securing rooms.)

Southern Hotel. The American-plan rate is \$5 a day for a room without bath, and \$6 a day for a room with bath. The rate is \$10 a day if two persons occupy the room.

Planters' Hotel. Room without bath occupied by one person, \$3 to \$4 a day; same for two persons, \$6 to \$7 a day. Room with bath, for one person, \$4 to \$5 a day; for two persons, \$7 to \$8 a day.

Jefferson Hotel. Room without bath, for one person, \$4 a day; two persons, \$6 a day. Room with bath, for one person, \$5 a day and up; two or more persons, \$7 a day and up.

St. Nicholas Hotel. Room without bath, for one person, \$2.50 to \$3.50 a day; for two persons, \$4 to \$5 a day. Room with bath, for one person, \$3 to \$5 a day; for two persons, \$5 to \$7 a day.

Lindell Hotel. Room without bath, for one person, \$2 a day; for two persons, \$3 a day. Room with bath, for one person, \$3 a day; for two persons, \$4 a day.

Washington Hotel. Room without bath, for one, two, or three persons, \$5 to \$7 a day; room with bath for one, two, or three persons, \$8 a day.

Laclede Hotel. Room without bath, for one person, \$1.50 to \$2 a day; for two persons, \$3 a day; room with bath, for one person, \$3 a day; for two persons, \$5 a day.

Terminal Hotel. Room without bath, for one person, \$2 to \$3 a day; for two persons, \$4 to \$5 a day. Room with bath, for one person, \$5 a day; for two persons, \$7 a day.

Mosier Hotel. \$1 to \$3 per day, European plan, with "Silver Moon" Restaurant attached at very reasonable rates. Located at Ninth and Pine sts.

Hotel Rozier. Opposite Exposition Building, Olive and Thirteenth sts. Rooms without bath, \$1 to \$2 a day.

Mammoth Hotel Company. S. E. cor. Olive and Twelfth sts. Can accommodate 2500 guests a day at rates from 50 cents to \$1.50 a day.

The Inside Inn. With a capacity for 5500 people, it is within the Exposition grounds, erected under a contract with the Exposition management, stipulating its rates. This Hotel offers 500 rooms at \$1 a day, 500 at \$1.50 a day, 500 at \$2 a day, and the remainder, which are larger with baths, at higher rates.

The Napoleon Bonaparte, The Forest City, The Fraternal, The University, The Kenilworth, The American, The Epworth, The Grand View, The States, The Oakland, The Iowa, The Guaranty, The West Park, The Christian Endeavor, The Visitors, and others, with a capacity for from 500 to 5000 guests, are within easy walking distance of the World's Fair gates. In fact, we have hotels, boarding-houses, apartment houses, and room-

ing-houses all over the city, of respectable character and on the street car lines.

An impression prevails that there may be lack of accommodation at reasonable prices. Not only will there be *sufficient room* for all who come, but *the rates will be reasonable*. We appeal to the profession of the country to give information respecting the accommodations in a spirit of fairness and justice to St. Louis based upon the above facts. St. Louis is prepared to care for and welcome all comers, and to show them the grandest Universal Exposition of the world's resources and products in the history of man.

The Fourth International Dental Congress is now an assured success. Many foreign nations have signified their intention to take part in this Congress; the islands of the Pacific Ocean will be well represented. Their assembling in the center of this great Republic should stimulate every American dentist to action, and each individual of this great profession should feel under obligations to help to push the Congress to a successful issue. We have our professional record to maintain and to act the part of host. As a consequence we should endeavor to sustain the reputation of American hospitality. Here is the birthplace of the dental college, most of the inventors, the mechanical geniuses, and the men who have brought about the wonderful advances in our great profession. We trust the profession of America will take hold with their accustomed vigor, will let nothing be undone that will be for the good of the profession, and carry all things with a most liberal spirit to a surprising conclusion.

A list of hotels, boarding-houses, rooming-houses and private homes with their rates appended will be furnished by the committee to all who ask. Any other information will be freely given by corresponding with any of the following committee:

D. O. M. LECRON, *Ch'man*,
Mo. Trust Bldg.
MAX FENDLER, *Sec'y*,
Mo. Trust Bldg.
H. F. D'OENCH,
GEO. H. GIBSON,
S. H. VOYLES,
ORME H. MANHARD,
JOSEPH G. PFAFF,
G. S. KITCHEN.

St. Louis and Its Surroundings.

The climate of St. Louis is temperate in summer and most delightful in the spring and autumn. The weather which visitors to the Louisiana Purchase Exposition may expect is shown by the "normals" at St. Louis, taken from the records of the United States Weather

Bureau. These "normals" are the averages of the temperatures at St. Louis during the thirty-three years that the Weather Bureau has had a station in St. Louis. The "normals" are as follows: May, 66.1; June, 75.4; July, 79.4; August, 77.6; September, 70.2; October, 58.7; November, 44.3. How closely the actual temperature for any one year follows the normal is well shown by the mean temperature for the month taken by the Weather Bureau at St. Louis during the past year. These temperatures are: May, 71.8; June, 74.2; July, 80.3; August, 76.4; September, 66.4; October, 62.2; November, 63.3. The weather at St. Louis during October and November is particularly pleasant. It is the "Indian summer" of the middle states.

St. Louis is the most central and most accessible of the four large cities of the United States. Twenty-seven railways enter it, besides passenger steamers on the Mississippi reaching it from the north and south.

World's Fair cheap rates on railways and steamboats will be offered during the whole Exposition season as follows: Season tickets for eighty per cent. of double one fare, good to return until December 15th. For sixty days, one and one-third fare, not good to return after December 15th. For ten days, one fare plus two dollars, from points within 250 miles of St. Louis. For fifteen days, one fare plus two dollars, from points over 250 miles from St. Louis.

St. Louis is the fourth city of the United States in point of population, having 750,000 people. It presents peculiar attractions for the student of nature, science, history, etc. There are twenty-four public parks, containing over 2100 acres of well-improved property. The World's Fair grounds lie five miles from the Mississippi river on the eastern border of the state, and are reached quickly and comfortably by steam railways and electric lines. Visitors reach the city through one of the largest rail-

way stations in the world; thirty-two tracks enter the station side by side. Most of the hotels, except those in the World's Fair grounds, are within ten minutes' ride of the station, which is in the heart of the business district. Street cars reaching all of the hotels for a single five-cent fare pass the station, and the cab, carriage, and baggage system is excellent.

Nearly every member of the Fourth International Dental Congress will wish to see the World's Fair. The Local Committee of Arrangements has already planned a special "Congress day" at the Exposition, and ample opportunity will be provided for members to enjoy visiting this greatest of all expositions. Congressman Baltholdt in a recent speech made before the Congress of the United States, among other things, said: "All in all, the Universal Exposition of 1904 will be the sensational climax of the twentieth century, the grandest victory of peace and civilization, the greatest triumph human genius has yet achieved. To millions of its visitors it will be an academy of learning, an inspiration and an inexhaustible source of genuine delight, and the memories of the 'Ivory City' will live and bear fruit in the ages yet to come."

Visitors From Abroad.

Extensive preparation is being made for the hospitable care and entertainment of all members attending the Dental Congress. The General Committee of Reception, aided by the local committees, is making every effort to provide for the comfort and care of all visitors. Dr. D. O. M. LeCron, Missouri Trust Building, St. Louis, chairman of the Permanent Local Committee and Bureau of Information, will be pleased to answer all inquiries regarding the accommodations for those who desire to secure them in advance of the Congress. A subcommittee of the General Reception Committee has been appointed to meet and

give information and direction to those arriving from Europe and elsewhere at the principal ports of entry of the United States, and to arrange the details of transportation from the seaboard to St. Louis. These committeemen will answer inquiries as to hotels, railways, etc. The subcommittees of the General Reception Committee for the principal ports of entry are—

New York—Drs. W. C. Deane, 114 E. 60th st., and Gladstone Goode, 35 W. 46th st.

Philadelphia—Drs. J. D. Thomas, 1122 Walnut st., Joseph Head, 1500 Locust st., and Julio Endelman, S. E. cor. Twelfth and Chestnut sts.

San Francisco—Drs. H. P. Carlton, 62 Crocker Bldg.; P. D. Gaskill, Crocker Bldg.

New Orleans—Drs. J. J. Sarrazin, Godchaux Bldg.; R. H. Welch, Godchaux Bldg.

Baltimore—Drs. Cyrus M. Gingrich, 608 St. Paul st., W. G. Foster, 813 N. Eutaw st., and B. Holly Smith, 1007 Madison ave.

In other cities not ports of entry but which may be visited by members from abroad, the following committeemen will furnish all desired information:

Buffalo—Drs. F. E. Howard, 331 Franklin st., C. W. Stainton, 47 N. Pearl st., S. Eschelman, 421 Franklin st.

Chicago—Drs. T. L. Gilmer, 31 Washington st., J. W. Wassall, 92 State st., W. V-B. Ames, 34 Washington st.

St. Louis—Dr. Wm. Conrad, 3666 Olive st. (chairman Local Committee of Reception and Arrangements).

Washington—Drs. H. C. Thompson, 1113 Pennsylvania ave., N. W., W. E. Dieffenderfer, 616 Twelfth st., Wms. Donnally, 1118 Fourteenth st., N. W., and W. N. Cogan, "The Sherman."

The following itinerary has been arranged for delegates from abroad desiring to make the trip from New York to St. Louis and return:

Arriving at New York, an opportunity will be offered to all who may desire to visit that Metropolis of America. Leaving New York on the N. Y. Central and Hudson River Railway by special train, Pullman coaches and dining car—if there should be one hundred and fifty or more in the party, otherwise by regular trains—at about 9 A.M., making a daylight run along the beautiful Hudson

River, the Rhine of America, with the Palisades, West Point Military Academy (said by Prince Henry to be the finest military school in the world) and the famous Catskills, on the west bank; with Peekskill, Garrison, Rhinecliff, Poughkeepsie, and Hudson, thence to Albany, the capital of the Empire State, on the east—a distance of about one hundred and forty-four miles of probably the most enchanting and varied railway scenery to be found in the world. From Albany along the Mohawk river, through the Mohawk valley, one of the most picturesque and charming to be found in America, and replete with historic incidents; thence passing through Schenectady, Little Falls, Utica, Rome, and Syracuse, the great salt-manufacturing city of the world. From Syracuse the route skirts the Erie Canal (upon which the state of New York is now expending in the neighborhood of \$100,000,000 on enlargements), passing through Lyons, Newark, and Palmyra, prosperous cities of from fifteen to twenty thousand population each, thence to Rochester, one of the most important inland cities in the country, but interesting chiefly because of the Genesee Falls, the greatest in sheer descent of any on the American continent. From Rochester the route is through a section of the finest fruit belt of the Atlantic coast, passing Byron, Batavia, and Depew, arriving at Buffalo, the great electrical city of the world, about 7 P.M., where the night will be spent at the Hotel Iroquois, one of the great hotels of America. A side trip to be made the following day to the ever-beautiful Niagara Falls, twenty miles away, returning to Buffalo for dinner and lodging at the Hotel Iroquois. Leaving Buffalo at 8 A.M., via the Lake Shore and Michigan Southern Railway, famous for the fastest mail trains in the United States service and also as the route of the "Twentieth Century Limited," running between New York and Chicago in twenty hours; the Lake Shore Limited, in twenty-four hours, and the twenty-six hour trains between Chicago and Boston. It is also the railway which, on October 4, 1895, won the world's record for long-distance speed, making the phenomenal run of 510 $\frac{1}{2}$ miles in 470 minutes, or an average of over sixty-five miles per hour.

This route skirts Lake Erie, passing through Dunkirk, Ashtabula, Cleveland, Toledo, Fort Wayne, and Elkhart, arriving in Chicago at about 9 P.M., where the night and following day will be spent in seeing that most wonderful city. Leaving Chicago at 10 A.M. or 10 P.M., via the Chicago and Alton Railway, whose route for the first thirty miles is along the great Chicago Drainage Canal, a public work surpassing in magnitude and

difficulties the building of the Suez Canal; thence to Joliet and Springfield, the capital of Illinois and the last resting-place of Abraham Lincoln, to Alton, arriving at St. Louis either at 6 P.M. or 7 A.M., depending on whether the time of leaving Chicago is in the morning or evening. At St. Louis the Hotel Jefferson is selected as headquarters for the Congress, with rates from seven to ten dollars per day, with bath, either for one, two, or three in a room, European plan—and reservations should be made not later than August 1st. Those desiring less expensive accommodations can secure them near the place of meeting by applying in advance to Dr. D. O. M. LeCron, Missouri Trust Building, St. Louis, Mo., U. S. A.

Returning, leaving St. Louis by way of the Pennsylvania Railway, the route is through Terre Haute, Indianapolis, Springfield, Columbus, Pittsburg, and Harrisburg, thence to Washington the capital of the United States, where stop-over privileges have been secured for those who may desire to spend a little time in seeing the most beautiful and interesting city in America. From Washington through Baltimore and Philadelphia, where stop-over privileges have also been secured, and thence to New York.

The rate for the round trip from New York, exclusive of sleeping-car charge and subsistence, is \$32.35. Arrangements have been made for any who may desire to return from St. Louis via the Big Four, Lake Shore, and Michigan Southern and the New York Central railways to New York.

Those who desire to take advantage of this itinerary should communicate with Dr. Deane or Dr. Goode of the New York Reception Committee, notifying either of them of the date of arrival and by what steamship line.

Membership in the Congress.

The following are the rules governing membership in the Fourth International Dental Congress, submitted by the Committee on Membership and approved by the Committee of Organization:

I. All reputable practitioners of dental and oral surgery who are entitled to membership in representative state, district, or local dental associations where they reside are eligible for membership in the Congress.

II. The state conference committees in America, and the national chairman of each foreign country have authority to receipt for

the membership fee, which, with the application for membership, shall be forwarded to the chairman of the Finance Committee, Dr. C. S. Butler, 680 Main st., Buffalo, N. Y., who will thereupon forward the official credentials conferring membership in the Congress.

III. If any difference of opinion arises in state committees or national committees as to the eligibility of an applicant for membership, the question shall be referred to the Committee on Membership of the Congress.

IV. The wives and children of the members of the Congress may be admitted upon special request and by consent of the Committee on Membership.

V. A uniform fee of ten dollars shall be paid for each membership, and each person whose name appears on the program either as essayist or clinician must be a paid member of the Congress.

J. D. PATTERSON,
Chairman Com. on Membership,
Kansas City, Mo., U. S. A.

Membership in the Congress will entitle the holder to all the privileges of debate and discussion of papers, and the right to vote upon all questions which the Congress will be called upon to decide. It will also entitle the members to participate in all the social functions of the Congress under the same conditions as enjoyed by others; to the official badges and insignia of the Congress; to one copy of the complete volumes of the Transactions, which it is anticipated will comprise not less than four volumes of about five hundred pages each. Judging from the material already offered, it is believed that the Transactions of the Congress will be the most complete exposition of modern dentistry yet published. This work will be sent to every member, whether he is able to be present at the Congress or not.

In order to avoid confusion and crowding of work at the last minute, those intending to apply for membership in the Congress are urged to send in their applications at once, which will give time to correct any error should one by chance occur.

All communications of a scientific nature must be submitted to the Committee on Essays for approval before

final acceptance for a place upon the program. All communications to the literary program of the Congress from foreign countries must receive the approval of the national committee of the respective countries from which they are sent before they can be accepted by the Committee on Essays of the Congress. Each essay must be accompanied by a *résumé* giving the substance of the communication in an epitomized form, which must be in the hands of the Essay Committee thirty days before the opening of the Congress, in order to give opportunity for translation and printing in advance of the Congress, and in order to secure a position upon the official program. All essays, titles of essays, and *résumés* thereof should be forwarded to Dr. Wilbur F. Litch, 1500 Locust st., Philadelphia, Pa., U. S. A., or to the secretary of the Committee of Organization.

Clinics.

All who intend to give clinical demonstrations should communicate with Dr. J. P. Gray, 212 N. Spruce st., Nashville, Tenn., U. S. A., chairman of the Committee on Clinics, who will make the necessary arrangements and supply suitable patients as far as may be possible. The rules governing the approval of literary communications by the several national committees will govern also the clinical demonstrations, and all arrangements for clinical demonstrations must be completed by August 1st in order to secure space and a place upon the program.

Exhibits.

All exhibits of a technical character relating to dentistry will be arranged for by the chairman of the Committee on Exhibits, Dr. D. M. Gallie, 100 State st., Chicago, Ill., U. S. A., to whom all applications should be made for space. All exhibits relating to dental education will be provided for upon application to Dr. Truman W. Brophy, Marshall Field Building, Chicago, Ill., U. S. A., chair-

man of Section IX—Education, Nomenclature, Literature, and History.

Prizes.

The Committee of Organization offers two prizes, viz, a handsome gold medal for the best essay on any subject pertaining to dentistry, and a similar medal for the best exhibit of an archæological character illustrating the development of dental art. All essays in competition for the gold medal prize are to be forwarded to Dr. James Truman, 4505 Chester ave., Philadelphia, Pa., U. S. A., chairman of the Committee on Prize Essays, without the name of the author attached, and designated by a motto, accompanied by a sealed envelope containing the name of the author and bearing upon its outside a duplicate of the motto upon the essay. The committee after having decided upon the respective merits of the essays and after having selected that one deemed worthy of the medal, will open the envelope bearing the duplicate motto and announce the name of the successful author. The other communications will be destroyed *incognito* six months after the Congress closes unless return of the unsuccessful essays be requested by the authors thereof within that period; or, at the option of the writers, the competing essays which fail to secure the medal may be referred to the Essay Committee for presentation before the Congress. The successful prize essay will be published as a part of the proceedings of the Congress.

The awarding of the prize for the archæological exhibit will be made by a committee to be appointed specially for that purpose. All exhibits competing for this medal will be cared for by the chairman of the Committee on Exhibits, Dr. D. M. Gallie, 100 State st., Chicago, Ill., U. S. A.

Medal.

The Committee of Organization has authorized the striking of a bronze medal commemorative of the Fourth Interna-

tional Congress. This handsome souvenir should be in the possession of every member of the Congress, as it is not only a beautiful work of art and intrinsically valuable as such, but it will be a memento of the greatest Congress of dentists ever held. The illustration is a half-tone reproduction of the artist's sketch and is worthy of careful study.



The figure upon the obverse side—that of St. Apollonia, which has been selected to typify dentistry—is one which not only serves the symbolic end, but one which lends itself particularly well to artistic treatment. The original design from which the illustration is reproduced is an artistic representation which has both merit and beauty. The symbolism of the reverse of the medal has been given ample consideration, and it is such as should meet with general approval. The universality and international character of the Congress movement is typified by the continental divisions of the world. The associated dates at the top of the design are those which embrace the professional life-history of dentistry. Falling gracefully down be-

tween the continents is a scroll upon which are to be inscribed the names of the recognized fathers of dentistry in all countries, each national body being asked to nominate the name or names to represent the respective countries. The pose of the eagle represents the auspices under which the Congress is to be held, and the palm branch a tribute of honor on behalf of the American profession to the fathers of dentistry.

The execution of the dies has been entrusted to the most expert die-sinker in America. The design is in high relief, and the medal will be struck in bronze, and will be about two and one-half inches in diameter. It will be a finished work of art in all respects, and an attractive and interesting souvenir of the great meeting which it typifies.

The medal will be supplied only to those who make application for it in advance of the Congress, as the number struck will be limited to the number subscribed for. The price of the medal without a case has been fixed at five dollars. Cases for the medal will be furnished at prices corresponding with their character and quality.

Those who desire to secure one of these souvenir medals will forward the amount of the subscription to Dr. Chas. S. Butler, chairman of the Finance Committee, 680 Main st., Buffalo, and the medal will be sent before the opening of the Congress. No medals will be available beyond the number subscribed for in advance of the Congress.

Present State of Organization.

The chairman of the Committee of Organization through Senator Depew has secured from Secretary of State the Hon. John Hay a promise to send through our foreign ambassadors and representatives an invitation on behalf of our government to all governments with which the United States is in diplomatic relation to send an official delegate to the Congress, and the Secretary has received notification that these invitations have been issued.

Upward of twenty nations have signified their intention to take part in this great Congress. No fewer than fifteen hundred committeemen are now actively at work promoting the success of the meeting. Every state and territory in the United States is in charge of a state committee actively at work in developing the details of the Congress in a local way. So that the prospect of an unusually large attendance is practically assured, and it is confidently expected that the membership in the Fourth International Dental Congress will be much in excess of any other dental meeting ever held. The number and character of essays already prepared, the number and character of the clinical demonstrations, the magnitude of the exhibits already arranged for, will surpass in these features all previous dental meetings. The work which has been accomplished by the Committee on Education, Legislation, and Dental History will constitute the most extensive contributions to these departments yet made.

The social features of the Congress are being provided for upon an elaborate plan. Receptions, luncheons, and various forms of entertainment are being arranged on a scale commensurate with the magnitude and importance of the meeting, and as much time will be given to the amenities of social intercourse as may be consistent with the more serious features of the program.

The Fourth International Dental Congress is now an assured success, and, judged from any standpoint, it will be a meeting which will not only adequately set forth the most recent developments of dental science and art, but it will constitute a liberal education in dentistry which no progressive practitioner can afford to miss.

An efficient corps of interpreters has been provided to assist those visiting members who are unfamiliar with the English language.

EDWARD C. KIRK, *Secretary*
Committee of Organization.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization of the Congress.

H. J. BURKHART, Chairman,
Batavia, N. Y.

E. C. KIRK, Secretary,
Lock Box 1615, Philadelphia, Pa.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer, 1420 Chestnut st., Philadelphia, Pa.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen, 1005 Sutter st., San Francisco, Cal.
- IV. Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.
- VI. Orthodontia. Chairman, E. H. Angle, 1023 N. Grand ave., St. Louis, Mo.
- VII. Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.
- VIII. Prosthesis. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.
- IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy, Marshall Field Bldg., Chicago, Ill.
- X. Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Committees.

Following are the committees appointed:

Finance. Chairman, C. S. Butler, 680 Main st., Buffalo, N. Y.

Program. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Exhibits. Chairman, D. M. Gallie, 100 State st., Chicago, Ill.

Transportation. (To be appointed.)

Reception. Chairman, B. Holly Smith, 1007 Madison ave., Baltimore, Md.

Registration. Chairman, B. L. Thorpe, 3666 Olive st., St. Louis, Mo.

Printing and Publication. Chairman, W. E. Boardman, 184 Boylston st., Boston, Mass.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey, 524 Penn ave., Pittsburg, Pa.

Dental Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel, 527½ Church st., Nashville, Tenn.

Membership. Chairman, J. D. Patterson, Keith and Perry Bldg., Kansas City, Mo.

Educational Methods. Chairman, T. W. Brophy, Marshall Field Bldg., Chicago, Ill.

Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

Prosthetic Dentistry. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.

Local Committee of Arrangements and Reception. Chairman, Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Essays. Chairman, Wilbur F. Litch, 1500 Locust st., Philadelphia, Pa.

History of Dentistry. Chairman, Wm. H. Trueman, 900 Spruce st., Philadelphia, Pa.

Nomenclature. Chairman, A. H. Thompson, 720 Kansas ave., Topeka, Kans.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally, 1018 14th st., N. W., Washington, D. C.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown, 175 Newbury st., Boston, Mass.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.

Prize Essays. Chairman, James Truman, 4505 Chester ave., Philadelphia, Pa.

Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.

Resolutions. Chairman, J. Y. Crawford, Jackson Bldg., Nashville, Tenn.

Clinics. Chairman, J. P. Gray, 212 N. Spruce st., Nashville, Tenn. Assistant chairmen: *For the West*—J. P. Root, Deardorf Bldg., Kansas City, Mo. *For the East*—H. B. McFadden, 3507 Hamilton st., Philadelphia, Pa. *For the South*—T. P. Hinman, Inman Bldg., Atlanta, Ga.

Nominations. Chairman, A. H. Peck, 92 State st., Chicago, Ill. W. E. Boardman, 184 Boylston st., Boston, Mass. M. R. Windhorst, 3518 Morgan st., St. Louis, Mo. Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Ad Interim. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

The officers of the Congress, honorary presidents, president, active vice-presidents, secretary-general, assistant secretaries and a treasurer will be nominated by the Nominating Committee—composed of two members of the Committee of Organization and two members of the Federation (F. D. I.) Committee, in accordance with instructions from the Director of Congresses, Hon. Howard J. Rogers.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material

progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.
DAVID R. FRANCIS, *President of Exposition*.

Fourth International Dental Congress.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

J. A. LIBBEY, *Chairman*,
524 Penn Avenue, Pittsburg, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing membership as prescribed by the Committee on Mem-

bership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of dentistry*. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state chairman, whose indorsement is a certification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the committee earnestly appeals to each eligible practitioner, in the United States who is interested in the success of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are as follows:

General Chairman.

J. A. LIBBEY, 524 Penn Ave., Pittsburg, Pa.

Vice-Chairman.

WM. CONRAD, 3666 Olive St., St. Louis, Mo.

State Chairmen.

Alabama. H. CLAY HASSELL, Tuscaloosa.
Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.

California. J. L. PEASE, Central Bank Bldg., Oakland.

Colorado. H. A. FENN, 500 California Bldg., Denver.

Connecticut. HENRY McMANUS, 80 Pratt St., Hartford.

Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.

District of Columbia. W. N. COGAN, The Sherman, Washington.

Florida. W. G. MASON, Tampa.

Georgia. H. H. JOHNSON, Macon.

Hawaii. M. E. GROSSMAN, Box 744, Honolulu.

Idaho. J. B. BURNS, Payette.

Illinois. J. E. HINKINS, 131 E. 53d St., Chicago.

Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.

Iowa. W. R. CLACK, Clear Lake.

Kansas. G. A. ESTERLY, Lawrence.

Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.

Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.

Maine. H. A. KELLEY, 609 Congress St., Portland.

Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.

Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.

Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.

Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.

Mississippi. W. R. WRIGHT, Jackson.

Missouri. J. W. HULL, Altman Bldg., Kansas City.

Montana. G. E. LONGEWAY, Great Falls.

Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.

New Hampshire. E. C. BLAISDELL, Portsmouth.

New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.

New Mexico. E. J. ALGER, Albuquerque.
 New York. B. C. NASH, 142 W. 78th St., New York City.
 N. Carolina. C. L. ALEXANDER, Charlotte.
 N. Dakota. ALBERT HALLENBURG, Fargo.
 Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.
 Oklahoma. T. P. BRINGHURST, Shawnee.
 Oregon. S. J. BARBER, Macleay Bldg., Portland.
 Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.
 Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.
 South Carolina. J. T. CALVERT, Spartanburg.
 South Dakota. E. S. O'NEIL, Canton.
 Tennessee. W. P. SIMS, Jackson Bldg., Nashville.
 Texas. J. G. FIFE, Dallas.
 Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.
 Vermont. S. D. HODGE, Burlington.
 Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.
 Washington. G. W. STRYKER, Everett.
 West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.
 Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.
 Wyoming. W. F. ROSEMAN, Sheridan.
 For the Committee of Organization,
 EDWARD C. KIRK, *Secretary*.

Fourth International Dental Congress.

REPORT OF THE COMMITTEE ON NOMINATIONS.

The Nominating Committee appointed by the Committee of Organization of the Fourth International Dental Congress presented the following nominations for officers of the Fourth International Dental Congress [the list as here given embracing corrections and acceptances to date of publication]:

"President"—H. J. Burkhart, Batavia, N. Y.
"Honorary Presidents"—James Truman, Philadelphia, Pa. A. H. Fuller, St. Louis, Mo. G. V. Black, Chicago, Ill. Thomas Fillebrown, Boston, Mass. S. G. Perry, New York, N. Y. Gordon White, Nashville, Tenn. E. T. Darby, Philadelphia, Pa. James McManus, Hartford, Conn. G. A. Bowman, St. Louis, Mo. H. A. Smith, Cincinnati, O.

T. W. Brophy, Chicago, Ill. Wm. Jarvie, Brooklyn, N. Y. Wm. Conrad, St. Louis, Mo. M. R. Windhorst, St. Louis, Mo. S. H. Guilford, Philadelphia, Pa. J. D. Patterson, Kansas City, Mo. C. C. Chittenden, Madison, Wis. Wm. Carr, New York, N. Y. E. H. Smith, Boston, Mass. M. H. Cryer, Philadelphia, Pa. E. A. Bogue, New York, N. Y. V. E. Turner, Raleigh, N. C. A. L. Northrop, New York, N. Y. S. A. Freeman, Buffalo, N. Y. J. W. David, Corsicana, Texas. J. Hall Moore, Richmond, Va. C. Newlin Peirce, Philadelphia, Pa. B. Holly Smith, Baltimore, Md. H. E. Beach, Clarksville, Tenn. D. O. M. LeCron, St. Louis, Mo.

"Honorary Presidents from Foreign Countries" (as far as appointed)—France: Ch. Godon, Paris. England: Walter Harrison. Spain: Florestan Aguilar, Madrid. Italy: V. Guerini, Naples. Holland: Jno. E. Grevers, Amsterdam. Switzerland: Paul Guye, Geneva. Australia: Alfred Burne, Sydney. Germany: W. D. Miller, Berlin. Denmark: V. Haderup, Faaborg. Canada: J. B. Willmott, Toronto.

"Vice-Presidents"—A. H. Thompson, Topeka, Kans. J. G. Reid, Chicago, Ill. George Fields, Detroit, Mich. Garrett Newkirk, Los Angeles, Cal. R. Ottolengui, New York, N. Y. R. M. Sanger, East Orange, N. J. D. N. Rust, Washington, D. C. N. S. Hoff, Ann Arbor, Mich. L. P. Bethel, Columbus, O. Jules J. Sarrazin, New Orleans, La. Chas. L. Alexander, Charlotte, N. C. C. H. Darby, St. Joseph, Mo. B. C. Nash, New York, N. Y. G. S. Vann, Gadsden, Ala. B. F. Luckey, Paterson, N. J. E. R. Warner, Denver, Colo. Wms. Donnally, Washington, D. C. Frank Holland, Atlanta, Ga. W. P. Dickinson, Minneapolis, Minn. E. K. Wedelstaedt, St. Paul, Minn. Adam Flickinger, St. Louis, Mo. V. H. Jackson, New York, N. Y. J. M. Whitney, Honolulu, Hawaii. Louis Ottofy, Manila, P. I. Cyrus M. Gingrich, Baltimore, Md. H. B. Tileston, Louisville, Ky. J. F. Dowsley, Boston, Mass. George E. Hunt, Indianapolis, Ind. M. S. Merchant, Giddings, Tex. M. L. Rhein, New York, N. Y. G. S. Shattuck, Detroit, Mich. W. L. Reed, Mexico, Mo. S. Leslie LeCron, Baltimore, Md. S. T. Bassett, St. Louis, Mo. W. A. Coston, Ft. Scott, Kans. F. L. Platt, San Francisco, Cal. H. F. Hoffman, Denver, Colo. Geo. Miller, Des Moines, Iowa. C. B. Reed, Topeka, Kans. H. T. King, Fremont, Neb. Richd. Cochran, Burlington, Iowa. H. C. Thompson, Washington, D. C.

"Vice-Presidents from Foreign Countries" (as far as appointed)—England: Wm. H. Williamson, Aberdeen. France: E. Sauvez, Paris. Spain: J. D. Losada, Madrid. Switzerland: L. C. Bryan, Basle.

"*Secretary-General*—Edward C. Kirk, Philadelphia, Pa.

"*Treasurer*—M. F. Finley, Washington, D. C.

"*Committee to Nominate Honorary Presidents and Vice-Presidents for Foreign Countries*—Edward C. Kirk, Philadelphia, Pa. Edward H. Angle, St. Louis, Mo. Wilbur F. Litch, Philadelphia, Pa."

Representatives of National Governments.

The representatives of national governments already appointed are as follows:

Spain—Jaime D. Losada, Florestan Aguilar, Luis Subirana.

Nicaragua—Leopoldo Ramirez Mairena, Benjamin Vidaurre.

MEETING OF THE COMMITTEE OF ORGANIZATION

Held July 16th, at St. Louis.

A MEETING of the Committee of Organization was held at St. Louis on July 16th, at which the following communication from Mr. Howard J. Rogers, Director of Congresses of the Universal Exposition, St. Louis, 1904, was received:

ST. LOUIS, July 15, 1904.

Dr. H. J. BURKHART, *Chairman Committee of Organization, Fourth International Dental Congress*, Batavia, N. Y.

Dear Sir,—In reference to the organization of the Fourth International Dental Congress, I request that you convey to the Committee of Organization the instructions of the Director of Congresses and of the Committee on Congresses to proceed forthwith with the permanent organization of the Fourth International Dental Congress. The reasons which have led the Exposition to take this step are briefly as follows:

The precedents established by the Second International Dental Congress in Chicago in 1893, and the Third International Dental Congress in Paris in 1900, wherein the Committee of Organization named the permanent officers;

Second, it has come to our attention in many ways that there seemed to be two factions interested in the Congress, one indorsing the action of the Committee of Organization, the other opposed to it. While legitimate rivalry is in no way to be discouraged, this opposition, from the best of our information, is based almost entirely upon personal motives, and as such cannot demand recogni-

tion on the part of the Exposition. It has also come to our notice that the methods of certain persons opposed to the Organization Committee, include the sending out of anonymous circulars and appeals to personal likes and dislikes. This does not commend itself to our sense of fair play.

We have received many communications representing the great body of neutral dentists who have absolutely no interest one way or the other in the dispute in question, and no sympathy with either faction but a great interest in the success of the Dental Congress, asking that steps be taken to preclude any further contest. And we are further of the opinion, based on many sources of information, that a contest of the nature into which this has developed will influence many prominent dentists in all parts of the country to have nothing whatever to do with the Congress.

We find also that the prevailing state of uncertainty in regard to the permanent organization of the Congress is detrimental to the preparation of the program, as the speakers and chairmen are reluctant to spend time and money upon the preparation of papers and upon traveling and other expenses, when there is even a remote contingency that their work may not be ratified by those finally in charge of the Congress.

We wish it distinctly understood that so far as the Exposition is concerned the matter of what officials control the Congress is of no consequence whatever. The measures, however, which will bring the highest degree of success to the Congress are of paramount importance.

After thoroughly considering the subject we are unanimously of the opinion that the best interests of the Congress will be promoted by empowering the Committee of Organization to select the permanent officers, so that stability and certainty may be given to the plans and obligations governing the Congress. We see no other way to secure this necessary condition of affairs than by instructing your Committee, who are the duly authorized representatives of the Exposition and whose actions have been in every case regular, to take such steps as will carry out the authorization contained in the first paragraph of this communication.

Yours respectfully,

HOWARD J. ROGERS.

In pursuance of the foregoing instructions the Committee of Organization elected Dr. H. J. Burkhart as president and Dr. Mark J. Finley as treasurer of the Fourth International Dental Congress.

Program

OF THE

FOURTH INTERNATIONAL DENTAL CONGRESS,

HELD AT

St. Louis, Mo., August 29 to Sep-
tember 3, 1904.

Department A — SCIENCE.

SECTION I.—ANATOMY, PHYSIOLOGY,
HISTOLOGY, AND MICROSCOPY. (*Chair-
man*—Dr. M. H. CRYER, 1420 Chestnut st.,
Philadelphia, Pa.)

Florestan Aguilar, Madrid, Spain. "Gen-
eral Anesthesia by Somnoform."

G. G. Campion, Manchester, Eng. "Deter-
mining the Actual Path and Extent of Move-
ment of the Mandible Condyle in the Living
Subject."

D. E. N. Caush, Brighton, Eng. "Is There
Uncalcified Tissue in the Enamel?"

M. H. Cryer. "Use of the Roentgen Rays
in the Study of the Internal Anatomy of the
Face."

W. T. Eckley, Chicago, Ill. "Phylogenetic
Evidence Regarding the Function of the Ac-
cessory Sinuses in Man."

John E. Grevers, Amsterdam, Holland.
"Anatomy of the Facial Skull—Normal and
in Mouth-breathers."

—— "Geometrical Construction of the
Mandible."

—— "Behavior of the Teeth Under Po-
larized Light."

A. Hopewell-Smith, London, Eng. "Some
Anomalies of the Hard Dental Tissues."

Eugene S. Talbot, Chicago, Ill. (Subject to
be announced.)

A. H. Thompson, Topeka, Kans. "Ethno-
graphic Odontography: The Mound-builders
and the Pre-Indian Peoples of the Mississippi
Valley."

J. G. Turner, London, Eng. (Subject to be
announced.)

Arthur S. Underwood, London, Eng. (Sub-
ject to be announced.)

O. Walkhoff, Munich, Ger. "Concerning
the Crania of Diluvial Peoples." (Illus-
trated with lantern slides.)

SECTION II.—ETIOLOGY, PATHOLOGY,
AND BACTERIOLOGY. (*Chairman*—Dr. R.
H. HOFHEINZ, Chamber of Commerce, Roch-
ester, N. Y.)

C. F. W. Boedecker, Berlin, Ger. "Percus-
sion in Dental Diagnosis."

G. W. Cook, Chicago, Ill. "The Effects of
Chemical Agents on Bacteria with Relation
to the Saliva."

Samuel A. Hopkins, Boston, Mass. "Appli-
cation of the Results of Research Work to
Daily Practice."

W. H. G. Logan, Chicago, Ill. "A Consider-
ation of Some of the Etiological Factors that
Produce Tissue Changes of the Alveolar Pro-
cess and Overlying Soft Parts."

Jos. P. Michaels, Paris, France. "Sial-
ology: Differential Analyses; Elements of
Value in Medical Diagnosis."

W. D. Miller, Berlin, Ger. "Researches
Relating to Various Pathological Processes
in the Teeth."

Louis Ottogy, Manila, P. I. "Observations
on the Causes of Erosion: (a) Erosio Areca
(betel erosion); (b) Erosio Orientalis."

M. L. Rhein, New York, N. Y. (Subject
to be announced.)

Oskar Römer, Strasburg, Ger. "Some Patho-
histological Observations on Pyorrhea Alveo-
laris."

D. D. Smith, Philadelphia, Pa. "Perice-
mental Abscess."

Eugene S. Talbot, Chicago, Ill. "Consti-
tutional Causes of Tooth-Decay."

F. Vicentini, Chieti, Italy. "Leptothrix
Racemosa."

SECTION III.—CHEMISTRY AND METAL-
LURGY. (*Chairman*—Dr. J. D. HODGEN,
1005 Sutter st., San Francisco, Cal.)

J. P. Buckley, Chicago, Ill. "Chemistry of
Pulp-Decomposition."

H. C. Carel, Minneapolis, Minn. (Subject
to be announced.)

J. D. Hodgen, San Francisco, Cal. "Chem-
istry and Dentistry."

Hof-Zahnarzt W. Pfaff, Dresden, Ger. "Das
Aluminium und seine Anwendbarkeit in All-
gemeinen."

R. W. Simon, Boston, Mass. (Subject to
be announced.)

Herbert L. Wheeler. "The Chemistry of Porcelain."

SECTION IV.—ORAL HYGIENE, PROPHYLAXIS, MATERIA MEDICA AND THERAPEUTICS, AND ELECTRO-THERAPEUTICS. (*Chairman*—Dr. A. H. PECK, 92 State st., Chicago, Ill.)

Samuel Taylor Bassett, St. Louis, Mo. "Application of Electro-Therapeutics to Dental Surgery."

L. P. Bethel, Columbus, Ohio. "Some Results from Dental and Oral Prophylaxis."

Julio Endelman, Philadelphia, Pa. "Contribution to the Therapeutics of Post-Extraction Accidents."

Richard Grady, Annapolis, Md. "Oral Hygiene: Mastication."

J. E. Hinkins, Chicago, Ill. "The Solvent Effect of Saliva on Cements."

Edward Hoffmeister, Baltimore, Md. "Materia Medica."

Prof. Dr. Jessen, Strasburg; Dr. Loos, Vienna; and Zahnarzt Georg Schlaeger. I. "Zahn-hygiene in Schule und Heer." II. Eine Wandtafel für den Ausschauungsunterricht in der Schule in Farben, "Gesunde und Kranke Zähne." III. Eine Wandtafel, ii. Auflage auch farbig, "Die Zähne und ihre Pflege."

Weston A. Price, Cleveland, Ohio. "Technique of the Application of the X Ray in the Treatment of Pyorrhea Alveolaris."

E. Sauvez, Paris, France. "Study of the Various Means of Inducing Local Anesthesia for Extraction of the Teeth."

Zahnarzt Dr. Schaeffer-Stuckert, Frankfurt-on-Main, Ger. "Paranephrin Bitser: a New Preparation of Kidney Atrabilarian in Connection with Local Anesthetics in Dentistry."

Edward Schlinkmann, Baltimore, Md. "Electric Absorption in Therapy."

C. R. Taylor, Streator, Ill. (Subject to be announced.)

Department B — APPLIED SCIENCE.

SECTION V.—ORAL SURGERY. (*Chairman*—Dr. G. V. I. BROWN, 445 Milwaukee st., Milwaukee, Wis.)

Chairman's address: G. V. I. Brown, Milwaukee, Wis. "Oral Surgery: Its Relations to General Surgery and Dentistry."

T. W. Brophy, Chicago, Ill. "Necessity for Early Operation for Cleft Palate."

T. L. Gilmer, Chicago, Ill. "The Teaching of Oral Surgery in Our Dental Schools."

W. E. Grant, Louisville, Ky. "Solid Tumors Involving the Body or Ramus of the Inferior Maxillary Bone."

J. G. Kiernan, Chicago, Ill. "Embryogenetic, Congenital, and Acquired Stomatoneurologic Relations."

A. H. Levings, Milwaukee, Wis. "Importance and Methods of Early Diagnosis of Malignant Growths Affecting the Maxillary Bone."

J. S. Marshall, San Francisco, Cal. "Fractures of the Mandible and Their Treatment."

E. S. Talbot, Chicago, Ill. "Etiology of Cleft Palate and Hare-lip."

SECTION VI.—ORTHODONTIA. (*Chairman*—Dr. EDWARD H. ANGLE, 1023 N. Grand ave., St. Louis, Mo.)

Edward H. Angle, St. Louis, Mo. "Malocclusion: Class II and Its Divisions."

G. V. I. Brown, Milwaukee, Wis. (Subject to be announced.)

L. C. Bryan, Basle, Switzerland. "Nature as a Regulator, and Our Duty as Her Assistants."

Calvin S. Case, Chicago, Ill. "Principles and Methods of Retention in Orthodontia."

M. Chiwaki, Tokio, Japan. (Subject to be announced.)

Wm. Slocum Davenport, Paris, France. "Contribution to the Treatment of Short Bite and Jump Bite Cases."

Robert Dunn, San Francisco, Cal. "Mesial Position of the First Molars in Class I."

John E. Grevers, Amsterdam, Holland. "Proposal for an International Nomenclature for the Various Forms of Malocclusion."

Chas. A. Hawley, Columbus, Ohio. "Method of Determining the Normal Arch, and its Application in Orthodontia."

Alfred Korbitz, Charlottenburg, Ger. "Orthodontia in Germany."

Francisque Martin, Lyons, France. "The Correction of Deformities in Fractures of the Nose."

R. Ottolengui, New York, N. Y. "Spreading the Maxillæ versus Spreading the Arch."

W. Booth Pearsall, Dublin, Ireland. "Irish Types of Malocclusion."

Herbert A. Pullen, Buffalo, N. Y. (Subject to be announced.)

Jose J. Rojo, Mexico City, Mex. "Study of the Etiology of Anomalies in Human Teeth."

Dr. Schroeder, Greifswald, Ger. "Prognathous Forms and Their Orthopedic Treatment."

A. Hopewell-Smith, London, Eng. (Subject to be announced.)

J. Sim Wallace, London, Eng. "Nasal Obstructions and Mouth-breathing, with Special Reference to Malocclusion of the Teeth."

Edmund Wuerpel, St. Louis. "Art."

Franz Zeliska, Vienna, Austria. (Subject to be announced.)

SECTION VII.—OPERATIVE DENTISTRY.

(*Chairman*—Dr. C. N. JOHNSON, Marshall Field Bldg., Chicago, Ill.)

E. A. Bogue, New York, N. Y. (Subject to be announced.)

Jas. M. Magee, St. Johns, N. B. "The Instrumentation and Filling of Crooked Root-Canals." (Illustrated.)

Sylvester Moyer, Galt, Ont. "The Enamel and Its Consideration in Cavity Preparation"

C. G. Myers, Cleveland, Ohio. (Subject to be announced.)

Garrett Newkirk, Los Angeles, Cal. "The Whole Question of Matrices and Their Uses."

Frank L. Platt, San Francisco, Cal. (Subject to be announced.)

Geo. C. Poundstone, Chicago, Ill. "The Cement Problem in Inlay Work."

M. L. Rhein, New York, N. Y. (Subject to be announced.)

Arthur Scheuer, Teplitz, Austria. "Tin-Cement, Sponge Tin: Two New Filling Materials and Their Uses."

E. K. Wedelstaedt, St. Paul, Minn. "Gold-and-Tin."

H. L. Wheeler, New York, N. Y. (Subject to be announced.)

SECTION VIII.—PROSTHESIS. (*Chairman*—Dr. C. R. TURNER, 33d and Locust sts., Philadelphia, Pa.)

L. W. Baker, Boston, Mass. (Subject to be announced.)

George Brunton, Leeds, Eng. (Subject to be announced.)

Reuben C. Brophy, Chicago, Ill. "Rationale of the Use of Materials for Base-plates in the Construction of Artificial Dentures."

Calvin S. Case, Chicago, Ill. "The Mechanical Treatment of Cleft Palate."

Edw. G. Christiansen, Drammen, Norway. "Which is the Ideal Crown—the Banded Crown or the Crown Without Band?"

B. J. Cigrand, Chicago, Ill. "Facial Guide Lines as Taught by Artists."

Bernard Frank, Amsterdam, Holland. "A New Articulator on Anatomical Principles."

Hart J. Goslee, Chicago, Ill. "Porcelain Crowns."

F. H. Mamlock, Berlin, Ger. "(a) Ueber Porzellanstiftzähne. (b) Ueber Magnalium Prothesen und ihre Herstellung nach Dr. Eug. Müllerschen Gummidrucksystem."

Francisque Martin, Lyons, France. "Immediate Prosthesis after the Method of Dr. Claude Martin."

Joseph Nolin, Montreal, Can. "The Decline of Estheticism in Prosthesis."

B. Platschick, Paris, France. "(a) Influence de Fauchard sur la Prothèse dentaire. (b) Les dents à tube en général et leur emploi special pour les pièces à genève continue. (c) Contribution à l'étude des Couronnes."

Jas. H. Prothero, Chicago, Ill. (Subject to be announced.)

Rudolph Weiser, Vienna, Austria. "Some Cases Illustrating the Possibilities of Prosthetic Dentistry."

E. Lloyd Williams, London, Eng. (Subject to be announced.)

Geo. H. Wilson, Cleveland, Ohio. (Subject to be announced.)

SECTION IX.—EDUCATION, NOMENCLATURE, LITERATURE, AND HISTORY.

(*Chairman*—Dr. TRUMAN W. BROPHY, Marshall Field Bldg., Chicago, Ill.)

M. Chiwaki, Tokio, Japan. "Dentistry in Japan."

Ch. Godon, Paris, France. "Educational Standards of Europe."

S. H. Guilford, Philadelphia, Pa. "Nomenclature."

A. W. Harlan, New York, N. Y. "Dental Literature."

A. O. Hunt, Omaha, Neb. "The Count System of Students' Credits."

Chas. McManus, Hartford, Conn. "International Character of the Early Development of Dentistry in America."

Louis Ottofy, Manila, P. I. (Subject to be announced.)

Jose J. Rojo, City of Mexico, Mex. "Historical Annotations and Present Condition of Dental Education in the City of Mexico."

B. L. Thorpe, St. Louis, Mo. "History of American Dentistry."

James Truman, Philadelphia, Pa. "A Practical View of Education."

SECTION X.—LEGISLATION. (*Chairman*

—Dr. WM. CARR, 35 West 46th st., New York, N. Y.)

(*Not received.*)

THE CLINICS.

PORCELAIN.

C. C. Allen, Kansas City, Mo.
W. V-B. Ames, Chicago, Ill.
E. H. Ball, Tama, Iowa.
C. W. Bruner, Toledo, Iowa.
J. Q. Byram, Indianapolis, Ind.
F. J. Capon, Toronto, Can.
W. A. Capon, Philadelphia, Pa.
R. W. Carroll, Beaumont, Tex.
R. M. Chase, Bethel, Vt.
F. E. Cheeseman, Chicago, Ill.
W. A. Coston, Ft. Scott, Kans.
F. P. Cronkite, St. Joseph, Mo.
W. H. Cudworth, Milwaukee, Wis.
L. E. Custer, Dayton, Ohio.
A. W. Dana, Burlington, Iowa.
S. F. Duncan, Joliet, Ill.
W. L. Fickes, Pittsburg, Pa.
Adam Flickinger, St. Louis, Mo.
W. H. Fordham, Scranton, Pa.
F. L. Fossume, New York, N. Y.
V. H. Frederick, St. Louis, Mo.
Edward Frumveller, Detroit, Mich.
H. J. Goslee, Chicago, Ill.
Joseph Head, Philadelphia, Pa.
W. C. Herbert, Detroit, Mich.
O. W. Hertig, Pittsburg, Pa.
J. C. Hertz, Easton, Pa.
J. F. Houston, Rio de Janeiro, Brazil.
W. C. Hubbard, Detroit, Mich.
F. B. James, Wilton Junction, Iowa.
Robt. LeCron, St. Louis, Mo.
R. W. MacDonald, Erie, Pa.
W. P. Menzies, Dyersburg, Tenn.
L. A. Meyer, Oconomowoc, Wis.

J. E. Nyman, Chicago, Ill.
W. T. Reeves, Chicago, Ill.
F. E. Roach, Chicago, Ill.
F. W. Proseus, Rochester, N. Y.
J. Sarrazin, New Orleans, La.
H. M. Seamans, Columbus, Ohio.
W. H. Taggart, Chicago, Ill.
C. N. Thompson, Chicago, Ill.
J. M. Thompson, Detroit, Mich.
J. E. Wait, Superior, Neb.
C. M. Work, Ottumwa, Iowa.

GOLD INLAYS.

C. L. Alexander, Charlotte, N. C.
F. T. Breene, Iowa City, Iowa.
H. B. Harrell, Gainesville, Tex.
J. M. Murphy, Temple, Tex.
O. H. Simpson, Dodge City, Kans.
C. N. Thompson, Chicago, Ill.
H. B. Tileston, Louisville, Ky.
W. F. Whalen, Peoria, Ill.
C. H. Wright, Chicago, Ill.

SURGERY.

T. W. Brophy, Chicago, Ill.
G. W. Cochran, Erie, Pa.
T. L. Gilmer, Chicago, Ill.
D. F. Keefe, Providence, R. I.
G. D. Moyer, Montevideo, Minn.

GOLD FILLINGS.

G. M. Beemer, Mason City, Iowa.
W. I. Bingham, South Farmington, Mich.
E. C. Blaisdell, Portsmouth, N. H.
W. B. Conner, Akron, Ohio.
J. W. Cormany, Mt. Carroll, Ill.
W. G. Crandall, Spencer, Iowa.
Edward Eggleston, Richmond, Va.
A. G. Fee, Superior, Wis.
J. W. S. Gallagher, Winona, Minn.
T. M. Hampton, Helena, Mont.
F. O. Hetrick, Ottowa, Can.
B. C. Hinkley, Keokuk, Iowa.
F. E. Howard, Buffalo, N. Y.
W. D. James, Tracy, Minn.
H. H. Johnson, Macon, Ga.
M. S. Merchants, Giddings, Tex.
J. G. Pfaff, St. Louis, Mo.
H. N. Richardson, Shenandoah, Iowa.
Arthur Scheuer, Teplitz, Austria.
C. H. Seeger, Manitowoc, Wis.
F. G. Van Stratum, Hurley, Wis.
J. W. Wick, St. Louis, Mo.

(*G. V. Black Club.*)

S. Bond, Anoka, Minn.

K. E. Carlson, St. Paul, Minn.
 W. R. Clack, Clear Lake, Iowa.
 J. V. Conzett, Dubuque, Iowa.
 Wm. Finn, Cedar Rapids, Iowa.
 O. J. Fruth, St. Louis, Mo.
 S. R. Holden, Duluth, Minn.
 A. M. Lewis, Austin, Minn.
 J. B. Pherrin, Central City, Iowa.
 G. A. Rawlings, Bismarck, N. D.
 A. J. Schlueter, Jr., Aberdeen, S. D.
 A. C. Searl, Owatonna, Minn.
 J. F. Wallace, Canton, Mo.
 E. K. Wedelstaedt, St. Paul, Minn.
 R. B. Wilson, St. Paul, Minn.

CROWNS AND BRIDGES.

J. R. Beach, Clarksville, Tenn.
 C. M. Bordner, Shenandoah, Pa.
 J. E. Chace, Ocala, Fla.
 H. J. Combs, Uniago, Ill.
 J. C. Corcoran, St. Paul, Minn.
 W. A. Coston, Ft. Scott, Kans.
 S. Finley Duncan, Joliet, Ill.
 Adam Flickinger, St. Louis, Mo.
 C. L. Frame, Columbus, Ohio.
 Val. H. Frederick, St. Louis, Mo.
 Otto J. Fruth, St. Louis, Mo.
 Hart J. Goslee, Chicago, Ill.
 F. A. Greene, Geneva, N. Y.
 W. H. Hayden, Youngstown, Ohio.
 J. G. Hildebrand, Waterloo, Iowa.
 C. W. F. Holbrook, Newark, N. J.
 J. G. Hollingsworth, Kansas City, Mo.
 F. B. James, Wilton Junction, Iowa.
 F. W. Ketner, Hudson, N. Y.
 Robt. N. LeCron, St. Louis, Mo.
 Russell Markwell, Galveston, Tex.
 J. A. Melendy, Knoxville, Tenn.
 L. A. Meyer, Oconomowoc, Wis.
 J. E. Nyman, Chicago, Ill.
 F. A. Pieso, Philadelphia, Pa.
 J. B. Ridout, St. Paul, Minn.
 R. M. Sanger, East Orange, N. J.
 H. A. Shannon, Lincoln, Neb.
 R. L. Simpson, Fincastle, Va.
 J. M. Thompson, Detroit, Mich.
 R. C. Tryanham, Hillsboro, Tex.
 J. Enos Wait, Superior, Neb.
 Craig M. Work, Ottumwa, Iowa.

GOLD CROWNS.

L. Dotterer, Charleston, S. C.
 J. G. Hollingsworth, Kansas City, Mo.
 C. M. Work, Ottumwa, Iowa.

ARTIFICIAL DENTURES.

J. B. Beauman, Columbus, O.
 H. H. Cassell, St. Louis, Mo.
 Everett M. Cook, Toledo, Ohio.
 Adolph Gropper, Milwaukee, Wis.
 L. P. Haskell, Chicago, Ill.
 P. B. McCullough, Philadelphia, Pa.
 T. W. Pritchett, Whitehall, Ill.
 S. J. Renz, Leavenworth, Kans.
 F. W. Slabaugh, Omaha, Neb.
 W. R. Smith, Pawnee City, Neb.
 G. H. Wilson, Cleveland, Ohio.

ORTHODONTIA.

Geo. D. Sitherwood, Bloomington, Ill.
 Richard Summa, St. Louis, Mo.
 W. E. Walker, New Orleans, La.

OBTURATORS.

R. R. Johnson, Great Falls, Mont.
 R. Ottolengui, New York, N. Y.
 R. M. Seibel, Kansas City, Mo.

PYORRHEA ALVEOLARIS.

B. F. Arrington, Goldsboro, N. C.
 E. C. Briggs, Boston, Mass.
 A. W. Harlan, New York, N. Y.
 W. H. G. Logan, Chicago, Ill.
 O. H. Manhard, St. Louis, Mo.
 R. G. Richter, Milwaukee, Wis.
 R. L. Schmitt, Waxahachie, Tex.
 H. T. Stewart, Memphis, Tenn.
 C. R. Taylor, Streator, Ill.
 Gordon White, Nashville, Tenn.

EXTRACTING.

J. W. Slonaker, Chicago, Ill.

MISCELLANEOUS.

Alden Bush, Columbus, Ohio. (Anatomical models for teaching cavity preparation, dental anatomy, etc.)

H. F. Cassel, St. Louis, Mo. (Striking up partial gold plate with swaged enforcement single thickness gold.)

J. D. Combs, Philadelphia, Pa. (Demonstration of nitrous oxid and air without the face-piece.)

Nelson D. Edwards, Wilmington, Ohio. (A new and original method of constructing dental splints.)

L. C. Elkin, St. Augustine, Fla. (Method of tin-lined amalgam fillings and amalgam inlays.)

W. L. Ellerbeck, Salt Lake City, Utah. (Electric furnace construction.)

Solomon Freeman, New York, N. Y. (The uses of compressed air in dental practice.)

C. L. Frink, Fernandina, Fla. (Dental electro-physics.)

Otto J. Fruth, St. Louis, Mo. (Replantation with porcelain restoration.)

A. N. Gaylord, Philadelphia, Pa. (Removal of pulp from as nearly a normal tooth as it is possible to obtain.)

Gillette Hayden, Columbus, Ohio. (Treatment of diseased pulps.)

F. E. Howard, Buffalo, N. Y. (Lining cavities with gold to enhance color of tooth before filling with amalgam. Filling with amalgam and gold combined at one sitting.)

V. H. Jackson, New York, N. Y. (Regulating system.)

R. R. Johnson, Gt. Falls, Mont. (Artificial velum and obturator.)

W. I. Jones, Nelsonville, Ohio. (Use of nitrous oxid in extirpation of pulp, and in treatment of pulpitis and alveolar abscess.)

Elgin MaWhinney, Chicago, Ill. (New drugs and some old ones; with therapeutics and indications for uses.)

A. F. Merriman, Jr., Oakland, Cal. (Aqueous Obtundent; (a) Excavating sensitive dentin; (b) General excavation.)

G. D. Moyer, Montevideo, Minn. (Some of the later appliances for treating fractures of the inferior maxilla.)

J. E. Orrison, Baltimore, Md. (Skiagraphy in connection with irregular teeth.)

A. Pont, Lyons, France. (Local anesthesia and general anesthesia combined with the use of ethyl chlorid.)

T. W. Pritchett, Whitehall, Ill. (Bonwill method of articulating full dentures.)

J. B. Ridout, St. Paul, Minn. (New method of backing facings for Richmond crowns; new method of making continuous gum plate; method of putting gold corner or filling in porcelain tooth.)

J. J. Rojo, Mexico City, Mex. (Taking impressions.)

E. Sauvez, Paris, France. (Local anesthetics for extractions and all operations of the mouth.)

M. I. Schamberg, Philadelphia, Pa. (Diagnostic and therapeutic application of the X ray to dentistry and oral surgery.)

Emil Schreier, Vienna, Austria. (Device by which the engine is started, stopped, and reversed at the hand-piece.)

H. A. Shannon, Lincoln, Neb. (Esthetic crowns and dummies.)

W. S. Simmons, Dayton, Ga. (Hand mallet in contour work.)

C. O. Simpson, St. Louis, Mo. (Demonstrating strength and durability of amalgams and cements.)

G. O. Sitherwood, Bloomington, Ill. (Soldering bands and fixtures; gold plating and adjusting.)

W. M. Slack, Memphis, Tenn. (Use of Vernon's non-crystal gold.)

D. D. Smith, Philadelphia, Pa. (Filling front teeth without wedging.)

W. R. Smith, Pawnee City, Neb. (Prosthetic.)

Richard Summa, St. Louis, Mo. (Practical application of Angle fracture band.)

J. D. Thomas, Philadelphia, Pa. (A demonstration of nitrous oxid and air without face-pieces.)

S. H. Voyles, St. Louis, Mo. (Saddle bridge; pinless teeth.)

E. R. Warner, Denver, Colo. (Masticating force of human jaws, demonstrated by appliances.)

(SUBJECTS NOT GIVEN.)

C. S. Case, Chicago, Ill.

C. M. Gingrich, Baltimore, Md.

Jas. Weirick, St. Paul, Minn.

EXHIBITORS.

The following manufacturers and dealers have reserved space up to date:

The S. S. White Dental Manufacturing Co.
Claudius Ash & Sons, Ltd.

H. D. Justi & Son.

Kress & Owen Co. "Glyco-Thymoline."

J. W. Ivory. (Specialties.)

Oakland Chemical Co.

American Cabinet Co.

Ransom & Randolph Co.

Ammonol Co.

Jno. T. Nolde Dental Manufacturing Co.

Hisey Manufacturing Co.

E. De Trey & Sons.

Johnson & Johnson.

Detroit Dental Manufacturing Co.

Harvard Co.

Lee S. Smith & Son.

Sanitol Chemical Laboratory Co.
 Jno. T. Milliken Co.
 S. Eldred Gilbert Dental Manufacturing Co.
 Ritter Dental Manufacturing Co.
 Young Dental Manufacturing Co.
 McKesson & Robbins Chemical Co.
 Dentists' Supply Co.
 Pinches & Ely. (Specialties.)
 Frink & Young.
 W. V-B. Ames.
 A. C. Clark & Co.
 Horlick's Food Co.
 Chas. H. Phillips Chemical Co.
 Whiteside Dental Manufacturing Co.
 Klewe & Co. (Jenkins porcelain.)
 R. C. Brophy.
 L. O. Green.
 L. D. Caulk.
 Dutro & Hewitt.
 Blair Dental Manufacturing Co.
 Peroxidant Chemical Co.
 Goldsmith Bros.
 Adrian Rutherford.

Note.—The United States Government will make an exhibit consisting of a complete dental outfit as furnished to the members of the Army Dental Corps.

At St. Louis.

FOURTH INTERNATIONAL DENTAL CONGRESS BANQUET.

THE banquet of the Fourth International Dental Congress will be held September 1, 1904, at 8 P.M., in the Coliseum, adjoining the Congress Hall.

The price per plate will be three dollars. It is requested that all who expect to attend send their names and money to Dr. A. H. Fuller, P. O. box 604, St. Louis, Mo., at once—and not later than August 20th. Arrangements to pay can be made with Dr. A. H. Fuller at the time of registration, provided notice be given before August 20th.

G. A. BOWMAN,
 A. H. FULLER,
 ADAM FLICKINGER,
Banquet Committee.

Fourth International Dental Congress.

OFFICIAL THROUGH TRAIN TO ST. LOUIS,

LEAVING NEW YORK CITY ON SATURDAY,
AUGUST 27TH.

AN official through train consisting of sleepers, dining car, observation car, and buffet-library-smoking car, will leave New York city, via New York Central Railway, on Saturday, August 27th, at 10 A.M., passing Albany at 1.15 P.M., connecting with trains from Boston and New England; passing Syracuse at 6 P.M., Rochester at 7.42 P.M., arriving at Buffalo at 9 P.M., leaving Buffalo (via Lake Shore Railway) at 9.20 P.M., passing Cleveland at 12.20 night, thence via "Big Four" Railroad, arriving in St. Louis about noon Sunday, August 28th.

Round trip ticket, fifteen-day limit, from New York, returning from St. Louis either direct or via Chicago and Alton Railway to Chicago, and Lake Shore Railway, with stop-over at Chicago and Niagara Falls, \$26.25. Sixty-day limit, \$32.25. These rates are exclusive of sleeping car.

Members living in the vicinity of New York will join the official train at New York city, and those from Philadelphia and vicinity at Buffalo. The same rates and accommodations can be secured via the Lehigh Valley Railway to Buffalo, thence to St. Louis from Philadelphia and vicinity as via any other direct line.

For information regarding reservation of berths, tickets, etc., from New York, Philadelphia, New Jersey, and New England, apply at once to Dr. W. C. Deane, 114 East 60th st., New York city. From Western New York and Canada, to Dr. F. E. Howard, 331 Franklin st., Buffalo, N. Y.

For the accommodation of those in the party hotel reservations in St. Louis should be made at the Jefferson Hotel, headquarters of the Congress, not later than August 1st, either direct or through Dr. D. O. M. LeCron, Missouri Trust Building, St. Louis, Mo.

Fraternally,

W. C. DEANE,
114 East 60th st., New York, N. Y.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

The next (fourth annual) meeting will be held in the Coliseum Building, St. Louis, Mo., August 26 and 27, 1904.

OFFICERS OF THE SECTIONS.

Education. President: T. W. Brophy. Vice-presidents: E. C. Kirk, W. B. Paterson, and O. Zsigmondy. Secretaries: Maurice Roy and R. B. Weiser.

Hygiene and Public Dental Service. President: W. D. Miller. Vice-presidents: Geo. Cunningham, E. Förberg, N. S. Jenkins, and C. Rüse. Secretaries: R. Heidé, E. Sauvez, and R. B. Weiser.

International Dental Press. President: E. Förberg. Vice-president: A. W. Harlan. Secretary: E. Papot.

Executive Council. President: Charles Godon. Vice-presidents: A. W. Harlan, and W. D. Miller. Secretary: E. Sauvez. Treasurer: F. Aguilar. Members: Geo. Cunningham, E. Förberg, R. B. Weiser, J. E. Grevers, F. Heidé, O. Klingelhöfer.

Program for Friday, August 26th.

INTERNATIONAL DENTAL FEDERATION.

The Federation will meet in the Coliseum Building at 11 A.M., Dr. Ch. Godon presiding.

Address of welcome by Dr. Wm. Conrad of St. Louis.

Response by Dr. Godon.

Address by a representative of the Louisiana Purchase Exposition.

Address by the Mayor of St. Louis.

Response by Dr. H. A. Smith of Cincinnati, Ohio.

Short addresses by the representatives of the foreign countries present.

President's address, by Dr. Ch. Godon.

INTERNATIONAL COMMISSION OF EDUCATION.

The International Commission of Education will meet in the Coliseum Building on Friday, August 26th, at 2 P.M., Prof. Truman W. Brophy of Chicago presiding.

Address by the president, Dr. Brophy.

Dr. Ch. Godon will give a *résumé* of "The Status of Dental Education in France."

Dr. Wm. Mitchell of London will make some observations on "Technical Education."

Dr. Gordon White of Nashville, Tenn., will

make a short address on the "Present Status of Dental Education in the United States."

Dr. R. B. Weiser of Vienna, Austria, will give an address on "Education."

(Drs. Banzhaf of Milwaukee, C. N. Johnson of Chicago, M. W. Foster of Baltimore, and W. E. Boardman of Boston, will read papers before the Commission of Education.)

COMMISSION OF HYGIENE AND PUBLIC DENTAL SERVICE.

The Commission of Hygiene and Public Dental Service will convene on Friday, August 26th, at 2 P.M., Prof. W. D. Miller of Berlin presiding.

Address by Prof. W. D. Miller on "Dental Hygiene in Germany."

Dr. Geo. Cunningham of Cambridge, Eng., will present a report on "Public Dental Service" by the late Dr. J. Frank of Vienna, Austria, with comments.

Dr. E. Förberg of Stockholm, Sweden, will present a paper on "Hygiene and Public Dental Service."

Other papers will be presented by members of the Commission.

COMMISSION ON INTERNATIONAL DENTAL PRESS.

The Commission on International Dental Press will convene on Friday, August 26th, in the French building at the Fair grounds, at 4.30 P.M., Dr. E. Förberg of Stockholm, Sweden, presiding.

Address by Dr. E. Förberg, president.

Paper by Dr. A. W. Harlan, New York, N. Y. "The Advantages of an International Review."

The program for Saturday will be published and distributed early on Saturday morning.

Dr. Conrad has secured the use of the French building for the members of the F. D. I., from 4 to 6 P.M. on Friday, August 26th.

The Executive Council will meet at 6.30 P.M., in the Hotel Jefferson.

Members of the dental profession affiliated with the dental societies in the United States or in foreign countries are cordially invited to join any or all the sections of the International Dental Federation.

On behalf of the Federation.

A. W. HARLAN, *Vice-president*,

1122 Broadway, New York, N. Y.

At St. Louis.

NATIONAL DENTAL ASSOCIATION.

At some opportune time during the progress of the Congress, the N. D. A. will meet for the election of officers and the transaction of whatever business may properly come before the association. Very likely some changes to the constitution and by-laws will be considered.

Time and place of meeting will be announced at a general session of the Congress.

A. H. PECK, *Rec. Sec'y.*

At St. Louis.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their annual meeting in the Coliseum building, corner Thirteenth and Olive streets, St. Louis, Mo., on August 25, 26, and 27, 1904, beginning promptly at 10 A.M. Telephone and telegraph offices in the building.

The committee on railroad accommodations for the East have made arrangements for fast through Pullman service to St. Louis from New York with the Delaware and Lackawana Railroad. Two special Pullman cars will leave New York Tuesday, August 23d, at 10 A.M. The cost of our excursion, including berth each way, will be \$35.50. A proportionate reduction is made for those going from Buffalo, Toledo, Fort Wayne, and cities on the line connecting with the Wabash Railroad. Those who desire to go by the special train should send notice as promptly as possible to Charles A. Meeker, D.D.S., secretary of the National Association, or to Guy Adams, division passenger agent of the Delaware and Lackawana Railroad.

Accommodations have been secured for the National Association of Dental Examiners at the Franklin Hotel—a first-class hotel—north-west corner of Sarah and Westminster Place, with rates from \$1.50 to \$6.00 per day, Eu-

ropean plan. Secure rooms by writing to E. C. Dunnivant, St. Louis Service Company, Seventh and Olive sts., St. Louis, Mo.

CHARLES A. MEEKER, *Sec'y,*
29 Fulton st., Newark, N. J.

At St. Louis.

AMERICAN SOCIETY OF ORTHODONTISTS.

A SPECIAL meeting of the American Society of Orthodontists will be held in the rooms of the Orthodontia Section of the Fourth International Dental Congress in the Coliseum, St. Louis, at 10 A.M., August 29, 1904.

ANNA HOPKINS, *Sec'y.*

At St. Louis.

DELTA SIGMA DELTA FRATERNITY.

MEETING OF THE SUPREME CHAPTER.

THE twentieth annual meeting of the Supreme Chapter, Delta Sigma Delta Fraternity, will be held Wednesday, August 31, 1904, at St. Louis, Mo. George E. Hunt, 131 E. Ohio st., Indianapolis, is chairman of the Committee on Arrangements.

At St. Louis.

INTERSTATE DENTAL FRATERNITY.

THE Interstate Dental Fraternity will hold its annual meeting at St. Louis, on Tuesday, August 30, 1904. The business meeting will be at 3 P.M., to be followed by a banquet.

The committee in charge are Dr. Burton Lee Thorpe, chairman, Dr. Edward Everett Haverstick, and Dr. Ernest P. Dameron. Members may procure their banquet tickets in advance by remitting to Dr. E. E. Haverstick, 346 N. Boyle Avenue, St. Louis.

R. M. SANGER, *National Sec'y.*

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS: August, September, and October 1904.

AUGUST.

AMERICAN SOCIETY OF ORTHODONTISTS. St. Louis, Mo. August 29th.

FOURTH INTERNATIONAL DENTAL CONGRESS. St. Louis, Mo. Six days: August 29th to September 3d.

INTERSTATE DENTAL FRATERNITY. St. Louis, Mo., August 30th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. St. Louis. Three days: August 25th to 27th.

VIRGINIA STATE DENTAL ASSOCIATION. Old Point Comfort. Three days: Aug. 2d to 4th.

SEPTEMBER.

CANADIAN DENTAL ASSOCIATION. Toronto, Ont. Three days: September 6th to 8th.

OCTOBER.

NORTHERN INDIANA DENTAL SOCIETY. Huntington. Two days: October 18th and 19th.

SOUTHWESTERN IOWA DENTAL SOCIETY. Osceola. Two days: October 11th and 12th.

CANADIAN DENTAL ASSOCIATION.

THERE will be a meeting of the Canadian Dental Association at Toronto, Ont., September 6, 7, and 8, 1904.

W. CECIL TROTTER, *Sec'y*, Toronto, Ont.

SOUTHWESTERN IOWA DENTAL SOCIETY.

THE Southwestern Iowa Dental Society will hold their eighth annual meeting at Osceola, Iowa, on October 11 and 12, 1904.

J. A. WEST, *Sec'y*, Creston, Iowa.

VIRGINIA STATE DENTAL ASSOCIATION.

THE thirty-fifth annual meeting of the Virginia State Dental Association will be held in the Chamberlain Hotel, Old Point Comfort, Va., August 2, 3, and 4, 1904. Reduced rates for members of the association and our guests. A cordial invitation is extended to our brethren of other states.

J. HALL MOORE, *Cor. Sec'y*.

NORTHERN INDIANA DENTAL SOCIETY.

CHANGE OF DATE OF MEETING.

THE date of our next annual meeting, to be held at Huntington, Indiana, has been postponed to October 18 and 19, 1904.

A program of unusual interest has been completed, a synopsis of which will be announced in the next issue of this magazine. Don't forget to read it.

OTTO U. KING, *Sec'y*,
King Building, Huntington, Ind.

HARVARD DENTAL ALUMNI ASSOCIATION.

AT the thirty-third annual meeting of the Harvard Dental Alumni Association, held at Young's Hotel, Boston, Mass., on June 27, 1904, the following officers were elected: Harry S. Parsons, '92, Boston, president; Ned A. Stanley, '84, New Bedford, vice-president; Waldo E. Boardman, '86, Boston, secretary; Harold DeW. Cross, '96, Nashua, N. H., treasurer. Executive Committee—Waldo E. Boardman, '86, Boston (*ex officio* chairman); Samuel T. Elliott, '01, Boston (for one year); Walter A. Davis, '01, Boston (for two years).

THE Council is composed of the above-named officers.

WALDO E. BOARDMAN, *Sec'y*, Boston, Mass.

IOWA STATE DENTAL SOCIETY.

THE forty-second annual meeting of the Iowa State Dental Society was held at Des Moines, Iowa, on May 3, 4, and 5, 1904. The following officers were elected for the ensuing year: J. V. Konzett, Dubuque, president; J. B. Pherrin, Central City, vice-president; C. W. Bruner, Toledo, secretary; Mae Reynard, Osceola, treasurer.

C. W. BRUNER, *Sec'y*,
Toledo, Iowa.

McLEAN COUNTY DENTAL SOCIETY.

At a special meeting, held June 20, 1904, at Bloomington, Ill., the McLean County Dental Society elected the following officers for the coming year: B. M. Van Dervoort, president; J. W. Crigler, vice-president; J. S. Reece, secretary; M. D. Young, treasurer. Executive Committee—O. J. Jarrett, J. W. Kase-

beer, C. P. Holland. Board of Censors—H. A. Stevenson, W. A. Land, A. M. Wilkes. Five new members were added to the roll, making a total membership of thirty-two.

J. S. REECE, *Sec'y*, Bloomington, Ill.

WATERVILLE (ME.) DENTAL SOCIETY.

THE Waterville (Me.) Dental Society was organized in May 1903 for the advancement and mutual benefit of its members. It held its first meeting at The Elmwood, and since has met on the first Friday of each month.

At each meeting a paper has been read followed by discussion; this has proved very beneficial. In May 1904 the society celebrated its first anniversary.

The officers are—E. H. Kidder, president; M. D. Johnson, vice-president; Guy Smith, secretary. Directors—E. L. Jones, H. E. Toward, and H. W. Mitchell.

DENTAL COLLEGE COMMENCEMENTS.**BIRMINGHAM DENTAL COLLEGE.**

THE annual commencement exercises of the Birmingham Dental College were held at the Jefferson Theater, Birmingham, Ala., May 2, 1904.

The degree of D.D.S. was conferred on the following graduates:

D. O. Bryant..... Alabama
Wm. Bushy..... Mississippi
R. R. Graham..... Mississippi
J. A. Hall, Jr..... Alabama

F. M. Stewart..... Alabama
E. C. Yielding..... Alabama
C. E. Zuber..... Alabama

HARVARD UNIVERSITY DENTAL SCHOOL.

At the annual commencement exercises of the Harvard University Dental School, held June 29, 1904, the degree of D.M.D. was conferred on the following graduates:

Charles Henry Calusdian William Sharpe Hamilton
Charles Douglas Carter James Chester Haynes
Raymond Boynton Carter Julius Frank Hovestadt
Ernest Herbert Caswell Marshal L. Howver, D.D.S.
Harry Sylvester Clark, B.S. Christopher W. Hurworth, M.A.C.D.
Frank LeRoy Eames Leon Julius Lawton
Nathan Anthony Estes Frank Donovan McDonough
Frederick Azro Gibbs, B.S. Leroy Matthew Simpson Miner

Melville Neal Otis
William Burton Rogers
Ubert Clifton Russell
Frank I. Shaw, D.D.S.
Benjamin Tishler
Charles Lincoln Twichell
Allan LaForest Watson
Eugene Barry Wyman

MICHIGAN UNIVERSITY, DENTAL DEPARTMENT.

At the recent commencement exercises, the degree of D.D.S. was conferred on the following graduates:

John Benedict Conlin
Anna Dieterle
Guy Harry Dillon

Rudolph Linton Gilkey
Claude Emory Markey
John Austen Ogden

Elmer LeRoy Whitman
William Henry Wismer

STATE UNIVERSITY OF IOWA, COLLEGE OF DENTISTRY.

THE twenty-second annual commencement exercises of the College of Dentistry of the State University of Iowa were held at Iowa City, Iowa, June 15, 1904.

An address was delivered by Hon. George D. Perkins.

The degree of D.D.S. was conferred by George E. MacLean, LL.D., president, on the following graduates:

Earl Addington.....Iowa
Everett Bidwell.....Iowa
Albert Jay Brock.....Iowa
John Joseph Burns.....Iowa
Alvernus Humphrey Cole.....Iowa
Earle VanZile Cutler.....Iowa
Bemper L. Dieffenbacher.....Iowa
Alvia Lee Duncan.....Iowa
Frank Vaughan Eberhart.....Iowa
Benjamin H. Erb.....Iowa
Milo Francis Fear.....Iowa
Frederick William Frahm.....Iowa
Charles Edward Gardner.....Iowa
Guy Garfield Goldthwait.....Iowa
Frank Vaclav Hasek.....Iowa
Leroy Clifton Hemsworth.....Iowa
Henry Vaughan Hinsdale.....Iowa
Fay Leslie Huff.....Iowa
William Francis Humphrey.....Iowa
James Newton Irwin.....Iowa
James Kennedy.....Ill.
Charles Joseph Kulp.....Iowa
Ralph O. McConnaughey.....Iowa

Roy McCulla.....Iowa
Walter Scott McIntosh.....Iowa
George Paul McKibbin.....Iowa
Homer Reese McVay.....Iowa
George Raymond Magruder.....Iowa
Reginald Maresh.....Iowa
William George Moss.....Iowa
Milo William Munger.....Iowa
George Henry Nies.....Iowa
Henry Clark Pelton.....Iowa
Charles David Rawhouser.....Iowa
Robert Ivan Shontz.....Iowa
William Ray Starbuck.....Iowa
William Henry Story.....Iowa
Edwin Scott Taylor.....Iowa
Earl G. Thompson.....Iowa
Francis Enos Tinker.....Iowa
John Vos.....Iowa
Ray Alfonso Watros.....Iowa
Earl H. Westenhaber.....Iowa
Wesley David Wiler.....Iowa
Lyman Wallace Woodruff.....Iowa
Arthur C. Wyant.....Iowa

WESTERN RESERVE UNIVERSITY DENTAL SCHOOL.

THE eleventh annual commencement exercises of the Dental School of Western Reserve University were held at the Beckwith Church, Cleveland, Ohio, on Thursday, June 16, 1904.

An address was delivered by Rt. Rev. John L. Spalding, Bishop of Peoria.

The degree of D.D.S. was conferred on the following graduates:

Byron Hugo Bowman
Martin Vanburen Boyd
Arthur Ira Brown, M.D.
George Humphrey Camp
Walter B. Challis
Leslie Merle Christie
William Clarence Cooper
Will Eugene Culp
Harry Dixon
Andrews G. Donaldson
Butler White Donaldson

Herbert Hamlin Dowd
Otto Frances Dusek
John William Frasier
Ralph Barclay Holeman
Raymond Edward Jackson
Frank Paul Leonard
John Francis McDonagh
Nicholas Newbury Mooney
Abram W. Ostrander
Joseph Norval Renouf
Don Arthur Richards

Harry Henry Rosenberger
Frank Daniel Segur
Ossip Solomon Shube
Lauren L. Smith
Wilbur Allen Smith
Tyrell M. Strangways
Ross Clayton Unger
Carl Henry Wadsworth
Edwin Wendell Walker
Edward A. Womachka

VANDERBILT UNIVERSITY, DEPARTMENT OF DENTISTRY.

THE twenty-fifth annual commencement exercises of the Dental Department, Vanderbilt University, were held at University Chapel, Nashville, Tenn., on May 3, 1904.

The address to the graduates was delivered by Mr. Allen G. Hall.

The degree of D.D.S. was conferred by Chancellor J. H. Kirkland on the following graduates:

C. M. Ballenger.....	Texas	D. L. King.....	Tennessee
E. C. Berwick.....	Louisiana	E. M. Long.....	Tennessee
W. L. Bloxom.....	Alabama	A. W. Miller.....	Mississippi
W. P. Bolding.....	Alabama	B. B. O'Bannon.....	Tennessee
T. W. Bond.....	Tennessee	W. L. Pippen.....	Alabama
Harley Cawthon.....	Florida	A. W. Roberts.....	Tennessee
A. S. Crigler.....	Mississippi	R. L. Rogers.....	Tennessee
R. W. Curry.....	Florida	D. A. Segrest.....	Texas
C. G. Ducote.....	Louisiana	H. N. Shepherd.....	Tennessee
E. O. Ellington.....	Texas	T. F. Simms.....	California
R. E. Foust.....	Tennessee	W. G. Sternberger.....	Tennessee
R. A. Freeman.....	Kentucky	P. W. Trowbridge.....	Louisiana
M. G. Gholson.....	Philippine Islands	L. N. Townsend.....	Mississippi
G. H. Heymann.....	Tennessee	C. E. Upchurch.....	Alabama
W. J. Hooker.....	Indiana	M. B. Varnado.....	Mississippi
R. P. Hope.....	Missouri	C. B. Wallace.....	Texas
T. M. Hudson.....	Tennessee	R. B. Warriner.....	Mississippi
W. P. Johnston.....	Tennessee	F. C. Wren.....	Louisiana

UNIVERSITY OF SOUTHERN CALIFORNIA, COLLEGE OF DENTAL SURGERY.

THE annual commencement exercises of the College of Dental Surgery, University of Southern California, were held at the Simpson Auditorium, Los Angeles, Cal., Thursday, May 12, 1904.

Addresses were delivered by Rev. F. M. Bristol and by Garrett Newkirk, M.D.

The degree of D.D.S. was conferred on the following graduates:

Claude E. Cole	A. Haynes Kirby, D.D.S.	Wilmir W. Rogers
Charles J. R. Engstrom	Glenn G. Miller	R. Lucius Spencer
Harry A. Fulson	F. Emil Mueller	George H. Sprague
Delos S. Gillespie	Herbert R. Packard	Frank S. Thornburg
J. Edward Guthrie	Leroy M. Packard	Alvin W. Viney
J. Delancey Holcombe	Royal A. Ritz	Charles C. Williams
Clarence C. Jarvis		

COLUMBIAN UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of Columbian University were held at Washington, D. C., May 30, 1904.

The degree of D.D.S. was conferred on the following graduates:

Charles Turk Bassett.....	New York	John Wesley McMichael...	Massachusetts
Albert J. T. Beatty.....	Delaware	Benjamin Jacob Madert...	Dist. of Columbia
Edward Elwell Belford....	Ohio	John Madert.....	Dist. of Columbia
Vivian Pratt Berry.....	Virginia	William A. Marschalk, Jr..	Florida
Charles Lucien Bovée.....	Dist. of Columbia	Archibald Louis Miller....	Dist. of Columbia
Louis M. Cuvillier.....	Dist. of Columbia	Herbert Ashton Moore....	West Virginia
William James Elzey.....	Maryland	Julian Pack.....	Pennsylvania
James Arthur Fluckey.....	Illinois	Clement Dowd Rozzelle....	North Carolina
Louis Samuel Glenn.....	New York	Arthur Millard Trivett....	North Carolina
Corbin Harriss.....	Maryland	Rarrett P. Willson.....	Maryland

ATLANTA DENTAL COLLEGE.

THE annual commencement exercises of the Atlanta Dental College were held in the Grand Opera House, Atlanta, Ga., April 28, 1904.

The valedictory address was delivered by Alton Sloan Ham.

The degree of D.D.S. was conferred by Judge W. R. Hammond on the following graduates:

Don T. Allison	James D. Harrell	Wilmer V. Pittman
Claude E. Battle	George Mortimer Harrison	Steve Hill Roan
Jno. A. F. Burgess	Johnson Lee Head	Robert C. Roberson
Richard Hankinson Calhoun	Benjamin F. Heriot	Glen F. Robins
Augustus H. Corley	Donald W. Herndon	James W. Rowan
Pettus B. Crum	P. D. Hicks	Joseph Gibson Sharp
Z. V. Dry	Thomas L. Hornsby	Charles Edward Smith
Warren St. Elmo Dubes	Guyton G. Howell	Joseph A. Smith
M. L. Dumas	W. H. Jarrell	Benjamin H. Spurlock
J. L. Dupree	Lawrence MacCaskill Jones	Arthur F. Thigpen
Benjamin Jasper Durham	Robert Moffatt Kennedy	James Melville Ware
N. Seymour Evans	Robert W. McCord	Mathew J. Ware
William Lee Ezzelle	J. L. McLaurin	Walter DeWard Webb
Hugh L. Fellers	Geo. Cummings Mizell	Joseph Norwood Weems
John Luther Gibson	Felix Morrow	William Claybourne White
Turner Granade	Risdon T. Nichols	Claude S. Williams
Charles Hooker Gray	John Robert Nickles	W. H. Wilson
Joel Willard Gray	Henry M. Owens	William Winston, Jr.
Robert Hamilton Gully	William F. Parramore	Nathaniel T. Woodard
Alton Sloan Ham	James E. Paulk	

SAN FRANCISCO DENTAL COLLEGE.

THE annual commencement exercises of the San Francisco Dental College were held at Native Sons' Hall, San Francisco, Cal., on May 17, 1904.

The degree of D.D.S. was conferred on the following graduates:

Angus C. Campbell	Benjamin L. Deane	C. S. Lee	Gustave C. Long
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COLLEGE OF PHYSICIANS AND SURGEONS, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the College of Physicians and Surgeons were held on Thursday, May 19, 1904, at the Alhambra Theater, San Francisco, Cal.

Addresses were delivered by Prof. D. A. Hodghead and Rev. Bradford Leavitt.

The degree of D.D.S. was conferred by Prof. Winslow Anderson, M.D., on the following graduates:

Arthur Van Acker	Albert T. Gruttner	Carl H. Schultz
Edward William Alsberge	Leon H. Marks	Clifford W. Scott
Shirley J. Ashby	Harry C. Mentz	Harry D. Smith
Ernest E. Badgley	Otis L. Miller	Albert R. Steinwand
Bertram C. Best	Roy Moore	Fancher D. Taft
J. Rudolph Blauer	Ernest K. Peters	Victor J. Veeki
Elbert E. Blosser	Albert D. Prince	Lew E. Wallace
Reuben R. Castle	Fletcher S. Pyle	J. Edwin Wieder
Edward L. Dornberger	Frederick G. Rees	George B. Yount
Wilhelm J. Fleckenstein		

LINCOLN DENTAL COLLEGE.

THE annual commencement exercises of the Lincoln Dental College (University of Nebraska) were held May 2, 1904, at Lincoln, Neb.

The degree of D.D.S. was conferred by Dr. W. Clyde Davis, dean, on the following graduates:

Mattie M. Davis
Daniel C. Dorwart
Alva E. Helfinstine

Walter E. Jack
Oliver K. Mapes

Ernest P. Stubbs
Joseph B. Troyer

TUFTS COLLEGE, DENTAL DEPARTMENT.

THE forty-eighth annual commencement exercises of the Dental Department of Tufts College were held June 15, 1904.

The degree of D.M.D. was conferred on the following graduates:

Charles Askowith
Wilson Darling Barron
Therese Eva Bonney
Ernest Phipps Brigham
Ernest Robbin Brooks
Charles Drew Brown
Jane Graupner Bunker
Charles Carter Butler
Ivan A. T. Centervall
Carey Roscoe Chester
Lester Dearborn Chisholm
Charles Peter Clarke
Stephen B. Collins
Joseph Benjamin Davis
Myrton Omer Davis
Dana Emerson Dearing
James Joseph Fenelon
Miles Hartley Fowler
Michael Joseph Fraher
Melville F. Francis

John Joseph Gibbons, Jr.
Edgar Frank Gilpatric
William Allen Gobie
Lynn Merton Goodrich
Walter Henry Grant
Henry Hersey Harrison
Frederick James Hart
Thomas Hennessy, Jr.
George Albert Jenkins
Elton Sumner Jewett
Alfred LeRoy Johnson
John Joseph Kennedy
Maud A. E. Kenney
Jeanette Emma King
Maurice Garfield Luce
Charles K. McGlew
George Francis McInnes
John Francis MacKeon
John Russell McKinnon
John Augustine Maguire

James Siemel Manster
Philip Frederick Moran
David Joseph Mullin
Oscar Leon Perrault
Ezra Barker Pike, Jr.
Nathaniel M. Preston
John Joseph Riley
Joseph Bernard Rockett
Morris Romanow
Clarence Endicott Smith
Harry Monford Smith
Alfred Gatzor Stegelman
Ernest Sherman Story
Thure Gustaf Streijffert
Charles Arthur Thomas
Stanley Burton Thorburn
Eugene Urbane Ufford
Ernest Leavitt Wells
Eugene Alfred Whittredge

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JUNE 1904.

June 7.

No. 762,086, to FRANK RITTER. Dental chair.
No. 762,231, to EDWARD R. DE NORMANDIE. Gold-saving dam.

June 14.

No. 762,289, to FRANK H. DAVIS. Crown tooth.

June 21.

No. 762,877, to ARTHUR W. BROWNE. Arm-rest for dental chairs.

June 28.

No. 763,385, to ALVIN L. FISHER. Swaging or fitting dental plates.

No. 763,918, to ROY L. MASON. Guard for dental tools.

THE DENTAL COSMOS.

VOL. XLVI.

SEPTEMBER 1904.

No. 9.

ORIGINAL COMMUNICATIONS.

TYPICAL AND ATYPICAL OCCLUSION OF THE TEETH IN RELATION TO THE CORRECTION OF IRREGULARITIES.

By **MATTHEW H. CRYER, M.D., D.D.S., Philadelphia, Pa.,**
PROFESSOR OF ORAL SURGERY, UNIVERSITY OF PENNSYLVANIA.

(Read before the New York State Dental Society, at its annual meeting, Albany, May 13, 1904.)

DURING the past three years many papers have been published on the subject of irregularities of the teeth and their treatment, and while some of them are of unquestionable value, covering points of capital importance in the field of orthodontia, the author feels, however, that due consideration has not always been given to the outlines of the face which are molded upon the topographical anatomy of the facial bones, the alveolar processes, and the teeth.

Some writers have given fixed rules for changing the position of the teeth, without bearing in mind the fact that each case demands the adoption of a special mode of procedure in its treatment. This wholesale correction by rule is causing many of the younger members of the profession to perform operations which are damaging to the patient and which cannot be rectified in later years. It is for this reason that the writer desired to present a paper which would bring

out a general discussion upon "Typical and Atypical Occlusion of the Teeth."

In the correction of irregularities of the teeth and their processes, three fundamental principles should always be considered. First, the operator should carefully regard the outlines of the face, especially as they should appear in early adult life; the difference in treatment demanded by the male and female type should be observed; the variations in each individual should be considered, and each case treated according to its own requirements. Second, due consideration should be given to the appearance of the teeth when the lips are open, as in talking and laughing. Third, the importance of occlusion in regard to vocalization, appearance, and mastication. As malocclusion often brings serious pathological conditions, such as impacted teeth, neuralgia, etc., this condition should receive most careful attention. It is the writer's opinion that the surgeon should

have a full knowledge of the superficial and internal anatomy of the maxillary bones, with that of the alveolar process, which is only the connecting structure between the teeth and the bones proper. He should also be thoroughly conversant with the physiology of this region and with the pathological changes of which it may become the seat.

TYPICAL *vs.* ACTUAL ANATOMY AND
OCCLUSION.

After close study of the forms of various bones of the human skeleton,

internal structures of the jaws and the occlusion of the teeth.

The illustration Fig. 1 is from a slide kindly loaned by Dr. I. N. Broomell, from a photograph of a negro skull which is in his possession. The reason for showing this picture is the fact that various authors give it as an illustration of normal occlusion of the teeth, omitting to state that it is from the negro race—in other words, that it belongs to a race more or less prognathic. The occlusion of the anterior teeth shows that it belongs to this type of skulls; it is a fine specimen, ex-

FIG. 1.



Upper and lower jaws of a negro skull, showing considerable prognathism.

both disarticulated and articulated, and the open spaces of the face, such as the oral cavity, the orbits, the nasal chamber with its associated pneumatic sinuses and cells, etc., the writer came to the conclusion that typical anatomy as taught in text-books is more ideal than true, and is something different from that with which the surgeon comes into daily contact, and it is his opinion that this divergence applied to a notable extent in reference to the jaws and teeth at rest and in occlusion.

In order to bear out this statement a few illustrations will be given showing the typical anatomy of the external and

cept that the upper second and third molars do not occlude typically with the lower third molars, even according to the negro type.

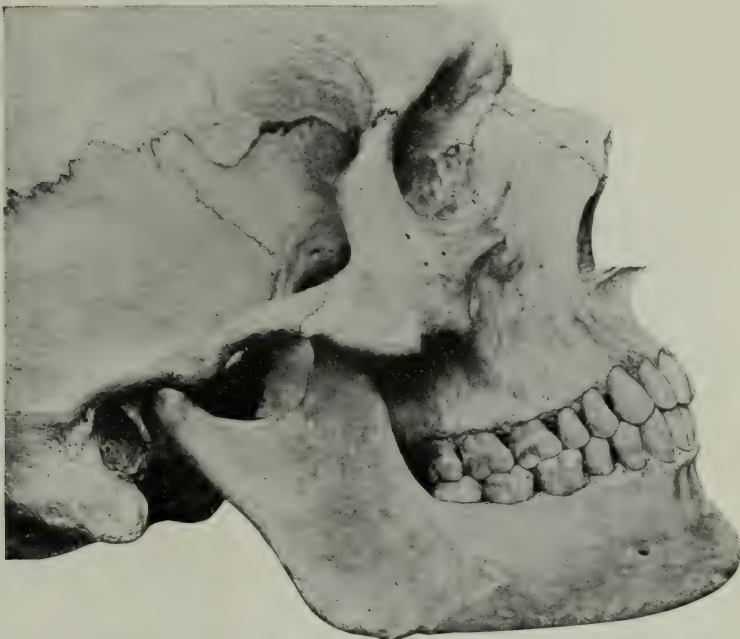
Fig. 2 is a side view made from an almost perfect skull of a white woman. The teeth are so nearly typical in occlusion that but few persons have found any fault with the specimen. The incisor teeth may possibly protrude too much to be in harmony with some Caucasian faces. The teeth, especially the anterior ones, must be in harmony with the general outline of the face and lips. In the general occlusion it will be found that each tooth of the upper jaw comes

into contact with two teeth of the lower jaw, except the third molar, while each tooth of the lower jaw comes into contact with two of the upper teeth, except the central incisors. The interlocking of the premolars and the molar teeth is ideal. It will be noticed that the mental foramen is on a line drawn down from between the premolar teeth; this is quite typical. After considerable research the writer has so far failed to find a more

Fig. 5 is from a vertical bilateral section of the upper and lower jaws. The molar teeth are shown in a typical occlusion transversely. It also shows the U-shaped cortical bone of the lower jaw and its alveolar process with the cancellated tissue within the arms of the U.

Fig. 6 is made from a skull from which the cortical bone of the alveolar process and part of the bone proper has been removed, together with some of the cancel-

FIG. 2.



Side view of upper and lower jaws of a Caucasian skull, showing typical occlusion of the teeth.

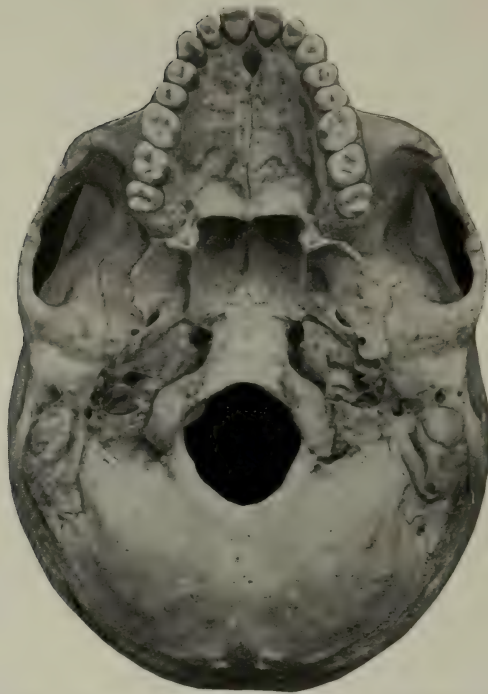
typical skull, with typical occlusion of the teeth.

Fig. 3 is made from the same skull as Fig. 2. It shows the base of the skull, the roof of the mouth, the occluding surface of the teeth, and the position in which they are held in the alveolar process. They are not arranged quite symmetrically. If the internal anatomy of the face were examined, reasons would be found for this slight variation.

Fig. 4 is made from the same skull as the two preceding figures. It shows the occluding surface of the lower teeth.

lated tissue. It reveals the greater portion of the internal anatomy of the jaws, which includes the roots of the teeth in their relation to each other and to the process. The life-history of the lower jaw, from the time of the development and eruption of the permanent teeth, can in a great measure be studied from this specimen. For instance, if the mental foramen be closely scrutinized, it is seen to be located in the true non-movable cortical bone of the jaw on a line drawn vertically downward between the premolars. It is the external opening of a

FIG. 3.



Under view of typical jaw, from same skull as shown in Fig. 2.

FIG. 4.

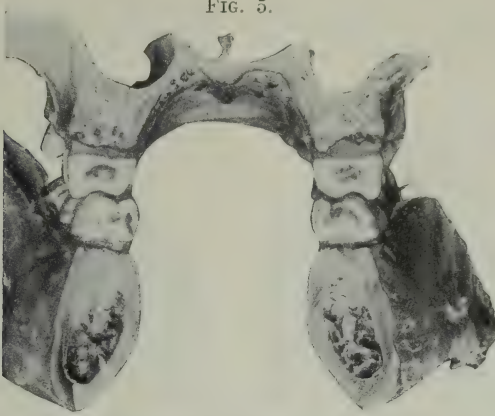


Part of the lower jaw from same skull as shown in Fig. 2, showing occluding surfaces of the lower teeth.

small tube communicating with the inferior dental canal. For this small tube, which the writer has described in previ-

ous papers, the name "mental tube" is suggested. Its internal opening into the inferior dental canal is situated in the

FIG. 5.



Transverse section through the upper and lower jaws, showing the typical occlusion of the molars.

FIG. 6.



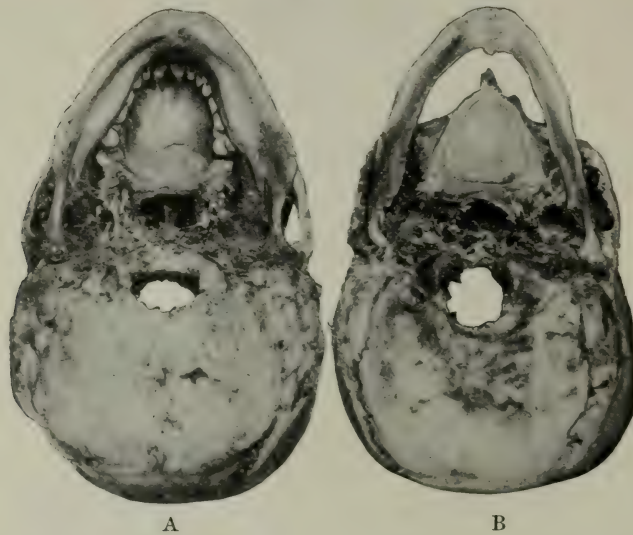
Antero-lateral view of the upper and lower jaws, with the external plates of the alveolar process and some of the cancellated tissue removed, exposing the roots of the teeth and the cribriform tubes.

movable cancellated tissue near the apex of the root of the canine.

If the skull of an infant be examined at birth, it will be found that the mental

tube, or short canal, passes directly outward nearly opposite the lower portion of the distance varying according to the age of the child until adult life is

FIG. 7.



Under view of two adult skulls: A, from a subject about twenty years of age; B, from one well advanced in years.

of the germ of the canine teeth. Then, again, if the skulls of children of various reached. In other words, the teeth at this point have moved the distance indi-

FIG. 8.



Side view of the two skulls shown in Fig. 7.

ages, up to adult life, be examined, it will be found that the inlet of this mental tube has been carried forward along with the cancellated tissue of the jaw, while the outlet has apparently moved back-

ward, the distance varying according to the age of the child until adult life is reached. In other words, the teeth at this point have moved the distance indi-

cated in this illustration by the length of the mental tube.
The position of the first premolar at the time of its early development was immediately below the upper or inner angle

of the jaw; as it increases in size and other molars are developed the whole mass of cancellated tissue containing the teeth moves forward, the upper portion a little more than the lower, as is indicated by the curvature of the trabecular and small cribriform tubes passing from the main tube or canal to the roots of the various teeth. To accommodate this growth the mandible proper or the cortical portion enlarges interstitially as this process is carried on. To interfere with

upper jaw recedes until the roof of the mouth becomes very small, as is well illustrated in B, Figs. 7 and 8.

VIEWS ON THE MOVING OF TEETH IN ORTHODONTIC OPERATIONS.

Some orthodontists speak of moving the teeth inward, outward, forward, or backward, as though they were dealing with plain porcelain teeth set up in wax on a mechanical articulator, without

FIG. 9.



Side view of the upper and lower jaws of a child about seven or eight years of age, showing the deciduous teeth, the first molars, and the germs of other permanent teeth.

this forward movement of the teeth in the cancellated tissue would arrest the enlargement of the jaw, it matters not whether the interference be caused by artificial means or by pathological conditions. The development of the alveolar process of the upper jaw is somewhat different. While the teeth are being developed and erupting, the process extends outward and forward without the same extension of the maxilla as is found in the mandible; when the teeth are finally lost in extreme old age the alveolar process of both jaws is resorbed, the extended rim of the mandible remains, while the

taking into consideration the anatomy, physiology, or pathological conditions presented in the jaws or the general system.

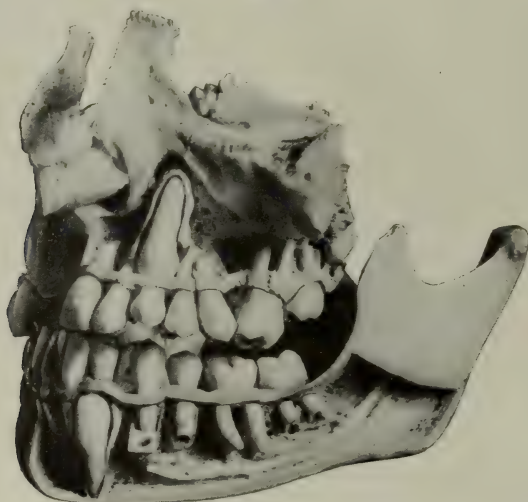
The writer can readily understand how teeth can be moved forward, as a rule, by orthodontists, as that is the direction of their general or usual movement during development or eruption into their proper positions. But he doubts the ability of any man to successfully move a lower first molar backward half its width when the other molars are in position. It may be possible—though it is somewhat doubtful—for the lower first molar to be

moved half its width backward in the mouth of a child about seven or eight years of age, but your essayist fears serious results even in such a case.

Fig. 9 is from a specimen of the lower jaw belonging to a child seven or eight years old. We find all the deciduous teeth in position, also the first molar. The developing crown of the second molar is just posterior to it. The germ of the third molar is not shown. Suppose it were possible to move the first

premolar and the roots of the upper first molar. It will be noticed that they are not in their true position; something has interfered with them. The disturbance may have been caused by a diseased condition of the second deciduous premolar, or some constitutional trouble. It might be that some mechanical appliance has been used, connecting the first molar with a lower tooth by means of rubber bands in the endeavor to move the lower tooth backward. Whatever may

FIG. 10.



Side view of upper and lower jaws of a child about twelve or thirteen years of age.

molar backward half its width, would it not interfere very materially with the second molar by disturbing its true position—by carrying it backward and turning it over to a greater or less extent?

Fig. 10 is from a similar preparation, of a child about twelve or thirteen years of age. If the first molar had been moved backward half its width, at the age of seven or eight years, the second molar would have been carried back with it. This would not have allowed proper space for the third molar, which would more than likely have become impacted.

Before passing to the next illustration it would be well to call attention to the position of the root of the upper second

molar and the roots of the upper first molar. It will be noticed that they are not in their true position; something has interfered with them. The disturbance may have been caused by a diseased condition of the second deciduous premolar, or some constitutional trouble. It might be that some mechanical appliance has been used, connecting the first molar with a lower tooth by means of rubber bands in the endeavor to move the lower tooth backward. Whatever may

have been the cause, however, some interference either mechanical or pathological has interfered with the physiological functions of these parts.

Fig. 11 is a radiograph taken from a cleaned specimen of the left side of the lower jaw showing the teeth in their position with the cancellated tissue. One might well imagine that a modern orthodontist had moved the first molar half its width backward or held it in such a manner that it could not advance. Whether this was done by a mechanical appliance or was the result of pathological causes, the tooth was held and impaction resulted. If the cancellated tissue be examined, as seen in the X-ray picture, it will be noticed that it is more dense

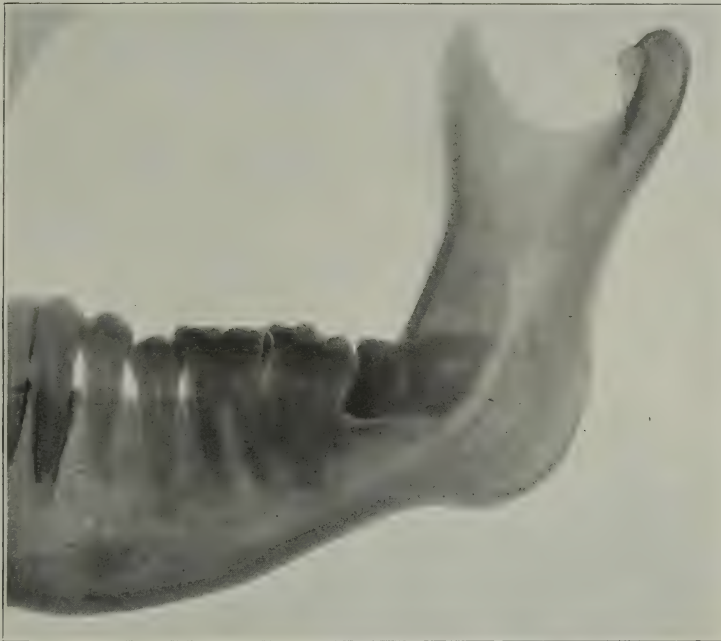
around the first and second molars than anteriorly to these teeth. As the result of an inflammatory condition the cancellated tissue has become united with the cortical bone, thus making another factor in preventing its sliding forward. It will be noticed that the roots of the molar teeth are also thickened by the over-action of the cementoblasts caused by this inflammatory condition.

The inferior dental canal or cribriform

was one of the primary causes of non-eruption of the third molar.

Fig. 12 is made from a plaster cast taken from the mouth of a young woman about twenty-five years old, in the practice of Dr. S. Merrill Weeks. The central incisors are erupted with their cutting edges pointing slightly inward instead of outward, probably due to some pathological condition of the deciduous incisors. The alveolar process around

FIG. 11.



From a radiograph taken from a cleaned specimen of the left side of the lower jaw, showing an impacted third molar.

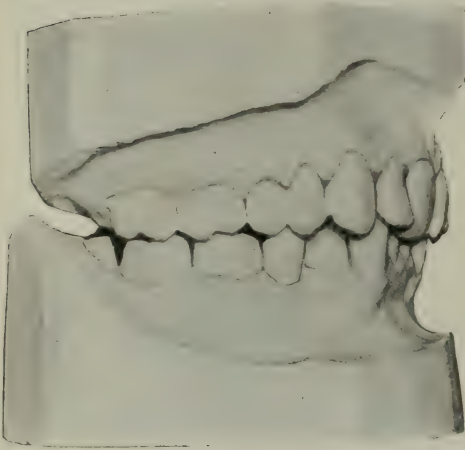
tube is slightly deflected from its true course below the roots of the impacted third molar, and also below the roots of the second molar.

It will be noticed that the second premolar stands below the occluding line of the other teeth. It has evidently been retarded in its eruption, perhaps through the premature loss or devitalization of the second deciduous premolar. In such cases these roots are resorbed very slowly and often cause inflammatory conditions of the process. It is possible that this

the incisors is harder than normal, which condition prevented these teeth from being carried outward during the eruption of the other teeth. They were thus locked against the incisors of the lower jaw, causing these and other lower teeth to be held back to a greater or less degree, which in turn would cause the impaction of the lower third molars. The right central is directed more inward than the left, and in proportion the lower right third molar was more deeply impacted than the lower left third molar. The

occluding surface of this tooth was cut away by the use of a carborundum disk which allowed the crown to rise slightly,

FIG. 12.



Made from plaster casts, showing an impacted lower third molar.

as is shown in the illustration, thus making the tooth more prominent and easier to extract.

EXTRACTION FOR THE CORRECTION OF IRREGULARITIES.

Many writers, especially of late, claim that irregularities of the teeth should always be corrected without the extraction of one or more teeth, as "Nature never puts teeth into a mouth that do not belong to that physiognomy." Your writer thinks this is doing Nature a great injustice; many teeth are found within the mouth which should be removed, not only for the correction of irregularities but for the general comfort and health of the patient. Modern civilization demands that we live contrary to rather than in accordance with Nature, and so long as this is so, we cannot blame Nature for existing irregularities or depend entirely upon her for beneficent results. Our numerous dental and medical colleges testify to the necessity of assisting Nature to become reconciled with modern methods of living.

Fig. 13 is made from two photographs

of upper jaws taken on the same plate. These pictures are to demonstrate that a small jaw can be crowded with large teeth, while a large jaw may have small teeth with space between them. It has been given as a reason for this condition that a child may inherit the jaw of one parent and the teeth of another, and for lack of a better explanation it may be well to accept this one for the present.

From a practical standpoint it matters not why such irregularities exist; they are there, and must be corrected. Notice the size of the teeth in the left picture. Beginning with the incisors and passing backward, the first premolar is extraordinarily large, as are also the molar teeth; there seems to be too much tooth tissue, as in addition two rudimentary fourth molars can also be seen. What would the non-extractor do with these two teeth? Would he endeavor to place them in their regular position, as shown in the illustration Fig. 25, or would he not rather acknowledge that these teeth should be extracted because they interfere with the general hygiene of the mouth?

Fig. 14 is a lateral view of the left picture of Fig. 13. The teeth are in occlusion with its mate, the lower jaw. It has been claimed by many that if the first molars or premolars be properly locked, the other teeth will be in good occlusion. The writer cannot agree with these two assertions. The illustration before us shows that the first and second molars of each jaw are typical in occlusion as well as the premolars. (The molars and premolars on the opposite side are in equally good occlusion.) If the above rules are to be followed, then the canine and incisor teeth should be correct, but they are not to be found so in the skull from which this illustration was taken. The incisors are in occlusion, edge to edge, instead of the upper one overlapping the lower one. A large amount of tooth tissue was shown in the upper jaw, and a large quantity in proportion in the lower jaw. In order to have had proper occlusion it would have been necessary to have lost tooth tissue laterally, in the lower

jaw. If this be granted, then the question arises, When should it have been lost,

16, 17, and 18, are made from plaster casts which have been loaned to the

FIG. 13.



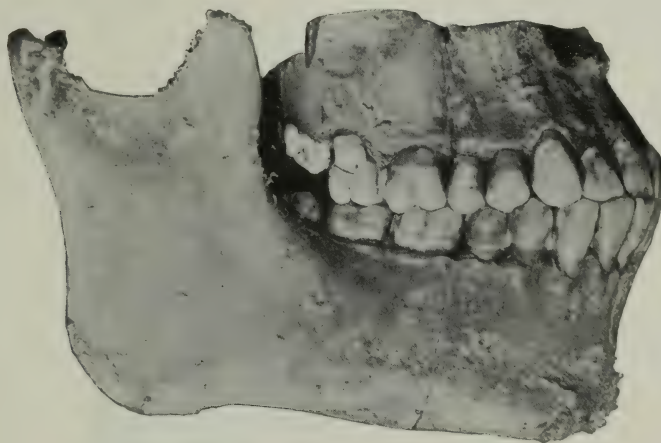
Made from two upper jaws, showing a large amount of tooth tissue in the smaller jaw, A, and much less in the larger jaw, B.

and what tooth or teeth should have been extracted? The loss of a first premolar on each side at the proper time would

writer by Dr. S. Merrill Weeks of Philadelphia.

Fig. 15 is taken from a cast of the

FIG. 14.



Upper and lower jaws in occlusion.

have made this occlusion better. It is possible that the loss of the lower central incisors might have accomplished the object by contracting the anterior portion of the alveolar process.

The succeeding illustrations Figs. 15,

mouth of a boy of about twelve years. It will be noticed that the molars are well locked and in the lower a second premolar is coming into proper occlusion. The deciduous canines are still in position. If the writer were treating such a case

he would extract the upper first premolar and then endeavor to draw the upper teeth backward, which in this case would

orthodontists to show the serious results produced by extracting the first molars. They give no explanation whatever of the

FIG. 15.

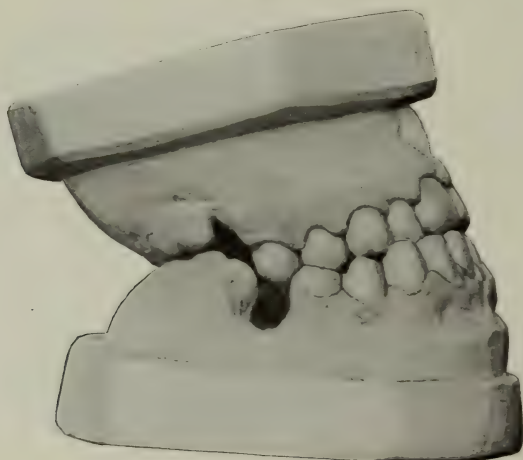


From plaster cast, showing malocclusion of the anterior teeth.

more than likely be practicable, as the first molars on each side of the mouth are well locked.

case. It is more than likely that these teeth were extracted by some general extractor on account of their decayed con-

FIG. 16.



From plaster cast, showing malocclusion of the teeth, claimed by some to be due to the extraction of the first molars.

Fig. 16 is taken from a plaster cast of a patient's mouth where four first molars had been extracted. This and similar illustrations are being used by certain

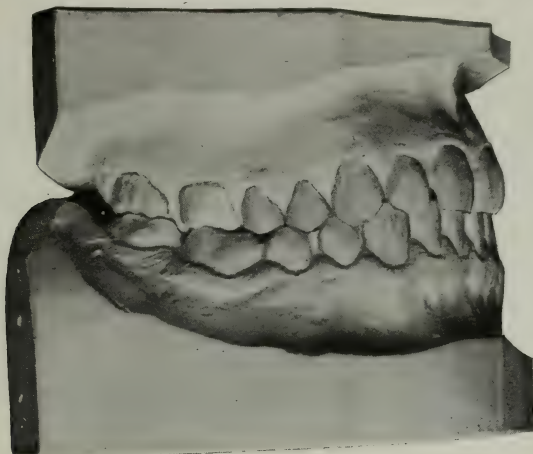
dition, and not with any idea of correcting irregularities or improving the future position of the teeth. No judicial conclusion can be reached either for or

against the extraction of the first molars in this particular case.

The following two illustrations are

the teeth. The occlusion is good; the position of the anterior teeth about typical. If all the teeth had been allowed

FIG. 17.



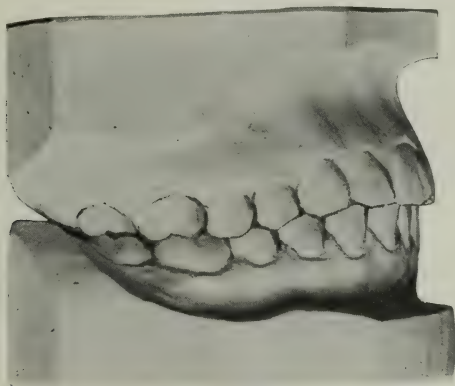
From plaster cast, showing good occlusion although the four first molars had been extracted.

from casts of mouths where the four first molars have been extracted.

Fig. 17. The four first molars were

to remain in these jaws it is more than likely there would have been protrusion of the anterior teeth, as the eruption of

FIG. 18.



From plaster cast, showing good occlusion although the four first molars had been extracted.

extracted evidently at the proper time, as the second and third molars have moved forward until they come into contact with the second premolars, without leaving the inverted A-shaped space between

the third molars would have pushed all the other teeth forward, provided the lower ones had not become impacted.

Fig. 18 is a picture taken from a plaster cast of the mouth of a young woman

whom Dr. Kirk had in charge from infancy. The first molars were soft, and Dr. Kirk thought it would be impossible to retain them in adult life. The an-

Figs. 19 and 20 are taken from a plaster cast of the mouth of a woman twenty-six years of age. The occlusion of the molar teeth is good. The two up-

FIG. 19.



From plaster cast, showing the turning of the two upper incisors and the loss of the lower second premolars.

terior teeth were somewhat irregular and crowded. After considerable thought he decided that the four first molars should be extracted. This was done at about the time the anterior cusps of the second molars made their appearance.

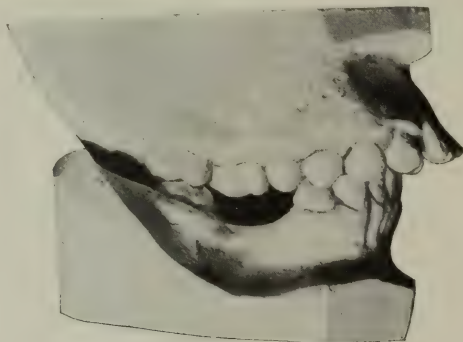
per centrals are protruding and turning upon their axes. The right one is slightly out of position and the left one more so. This protrusion and turning commenced about two years ago. One orthodontist claims that it was caused

FIG. 20.



From plaster cast, showing the twisting of the two upper central incisors.

FIG. 21.



From plaster cast, showing malocclusion of the teeth.

Little or nothing was done in regard to the correction of the anterior teeth; they naturally took their proper positions, with the results here shown. The profile of the lips and chin of this young woman is very good and is in harmony with the rest of her face.

by the extraction of the lower second premolars. It is possible this may have aggravated an already predisposing cause, but it is more than likely the protrusion and rotation of the teeth would have taken place even if the premolars had not been extracted. By going into the fam-

ily history of the patient the cause of this malocclusion is obtained. Several members of the patient's family both maternally and paternally are greatly troubled with arthritis—with bony deposits in and about the joints in various parts of the body. The writer would diagnose the cause of the protrusion and turning of the teeth as due to a similar condition—that is, deposit of calcium salts in the cancellated tissue around the teeth. This deposit will continue around the other teeth and they will become similarly affected unless medical aid can arrest this pathological action. Your essayist is at a loss to know how to hold the deformity in abeyance by either surgical or mechanical means. Mechanical appliances in such cases often act as an irritant, which in turn brings on a greater activity of the osteoblasts.

Fig. 21 is from a photograph of a plaster cast of the mouth of a woman about twenty-five years of age, showing the second molars in fair occlusion with each other. The lower first premolars are in occlusion with the upper first and second premolars instead of being between the first premolar and the canine tooth. The six anterior teeth protrude very much,

FIG. 22.



Profile view of face of person from whom the cast Fig. 21 was taken.

greatly disfiguring the face, as shown in Fig. 22. The writer could see no way of reducing this deformity except by extracting the six front teeth and cutting a portion of the alveolar process away, and this was done a short time ago.

CHARACTERISTIC FEATURES OF CAUCASIAN AND NEGRO SKULLS.

Fig. 23 is made from the under surface of two skulls. The one on the left

FIG. 23.

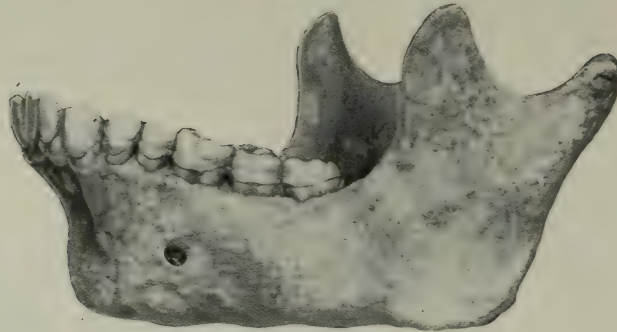


View of the under surfaces of skulls, showing difference between Fan Tribe West African skull and the Caucasian.

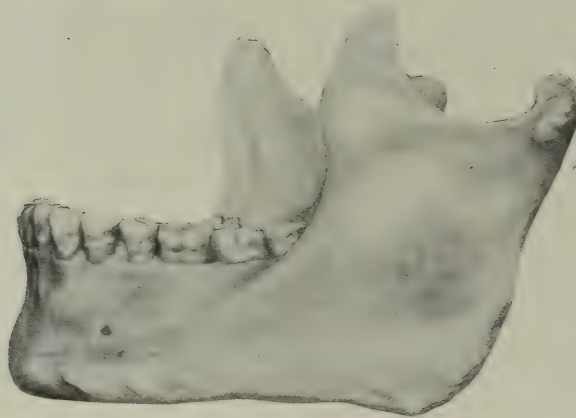
is that of a Fan Tribe West African, the other is from a Caucasian. They differ greatly in the shape of the roof of the mouth and the line of the occluding surfaces of the teeth. For these types of skulls they are normal in the arrangement of the teeth, with the exception of those lost by decay. The line of the occluding surfaces of the white skull is too nearly circular, however, to be termed typical. The special difference in these skulls is this: In the negro, if the outer line of the zygomatic arch be carried around until it intersects the teeth, that line will be near the anterior surface of the second molars; while in the other skull the line would be in front of the first molar, showing that the teeth are carried forward in the negro skull the width of a molar tooth.

Fig. 24 is made from two mandibles. The upper one is from the same Fan Tribe negro as shown in Fig. 23; the lower one is from another Caucasian skull. If the position of the third molar of the negro jaw be examined, it will be seen that there is room for another molar

FIG. 24.



A



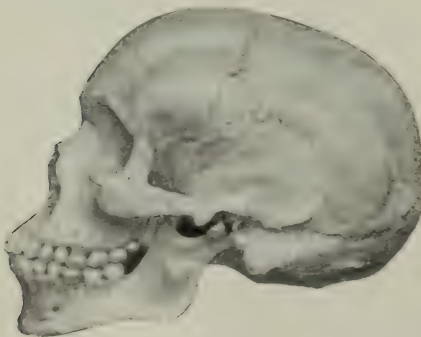
B

Two mandibles—A, from a Fan Tribe West African negro; B, from a Caucasian, showing difference in position of teeth relative to the ramus, mental foramen, and symphysis menti.

back of the third, while in the mandible of the white skull the third molar is far

be found below the first molar, while in the white jaw it is on a line drawn downward from between the premolars, showing again that in the negro skull the teeth are carried forward about the width of a molar tooth.

FIG. 25.



Side view of a prognathous negro skull with eighteen teeth in the upper jaw.

back, leaving no room for another tooth. In the negro jaw the mental foramen will

Fig. 25 is from the skull of another negro who died while in the Philadelphia Hospital. The prognathism is not so marked as in the one belonging to the Fan Tribe West African. The mental foramen in this case is situated on a line between the second premolar and the first molar. In the upper jaw there are eighteen teeth, the two most distal being rudimentary fourth molars. Barring these fourth molars, all the other teeth are in good occlusion. If this condition of the teeth were exhibited in the white race, which would give the appearance of that shown in the next figure, it would be good surgery to remove either the upper

or lower premolars or the upper and lower first molars on each side.

PROGNATHOUS APPEARANCE CAUSED BY
HYPERTROPHIED GUMS AND ALVEOLAR
PROCESSES.

Not having an anatomical specimen showing this kind of prognathism, your essayist has taken the liberty to show Fig. 26, which was made from the photograph of a boy about fifteen years old. When this picture was shown to one of

of gum, tooth, and alveolar tissue, or even bone, to correct such deformities, even if artificial teeth have to be worn afterward.

Fig. 29 is a lateral view of a skull. The distance from the mental foramen to the chin is short, although the chin appears to be prominent. This is due to the position of the anterior teeth and their processes, which have not grown or moved forward to their ordinary positions. In the upper jaw this lack of growth is more marked than in the lower,

FIG. 26.



From photograph of a lad suffering from hypertrophy of the gums and alveolar process.

our leading orthodontists, he declared it was that of a degenerate. The boy had a most marked hypertrophied condition of the gums and alveolar process of both jaws, which protruded forward. It was thought advisable to remove the alveolar process along with the teeth and gums, which gave him the appearance shown in the next picture.

Fig. 27 was taken three weeks after the operation. The prognathism is lost, leaving somewhat sunken cheeks.

Five years afterward he had the picture taken shown in Fig. 28. No one would claim that this picture was that of a degenerate.

These last three illustrations have been exhibited in order to justify the removal

as the teeth do not pass far enough forward to overlap the lower teeth. The molars are in good occlusion, but the first premolar is in the position of the second. The anterior portion of the alveolar process had become dense and fixed before the time for the eruption of these teeth, and consequently they could not get into proper position.

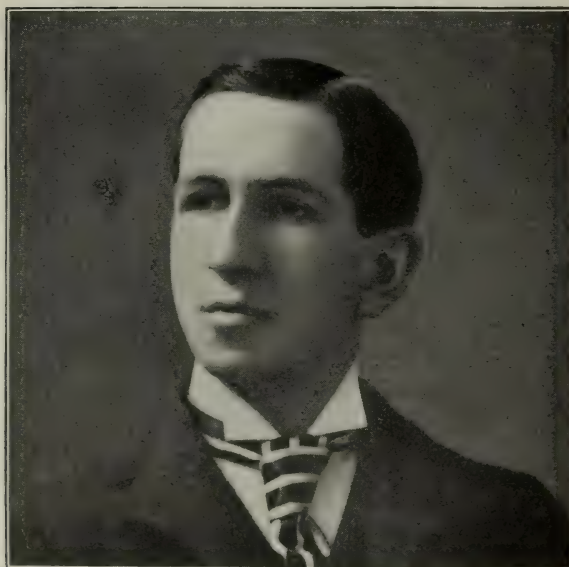
Fig. 30 shows the occluding surfaces of the upper teeth. The second premolars are erupted on the inside of the other teeth. It might be argued that if these could have been forced into their proper position the deformity would have been avoided; it is the opinion of the writer, however, that had they been forced into their proper places a much

FIG. 27.



From photograph taken three weeks after removal of the pathological tissue.

FIG. 28.



From photograph taken six years after operation upon the person represented in Fig. 26.

greater deformity would have occurred through the carrying of the cutting edges were carried outward and upward. They do not come into occlusion with the lower

FIG. 29.



Lateral view of upper and lower jaw, showing malocclusion of the anterior teeth.

of the anterior teeth forward and upward, as there is evidence that when the teeth, but the ground-off edges show that they did so at an earlier period.

FIG. 30.



View of the roof of the mouth and occluding surfaces of the teeth, showing the second premolars crowded to the inside.

first premolars and canines took their positions the cutting edges of the incisors

The following illustrations are taken from photographs of a patient of Dr. G.

Marshall Smith of Baltimore, who has kindly permitted the writer to use them in this paper. The patient is a girl thirteen years old.

nines are too nearly vertical or do not flare enough, especially in the lower jaw. The upper teeth are all erupted normally for the age, except the upper second

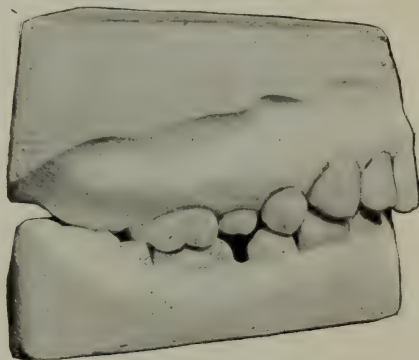
FIG. 31.



Profile of a patient thirteen years of age.

Fig. 31 gives a good idea of the profile. It is just the reverse of the contour shown in Fig. 26, giving the receding lips and prominent chin. From the ap-

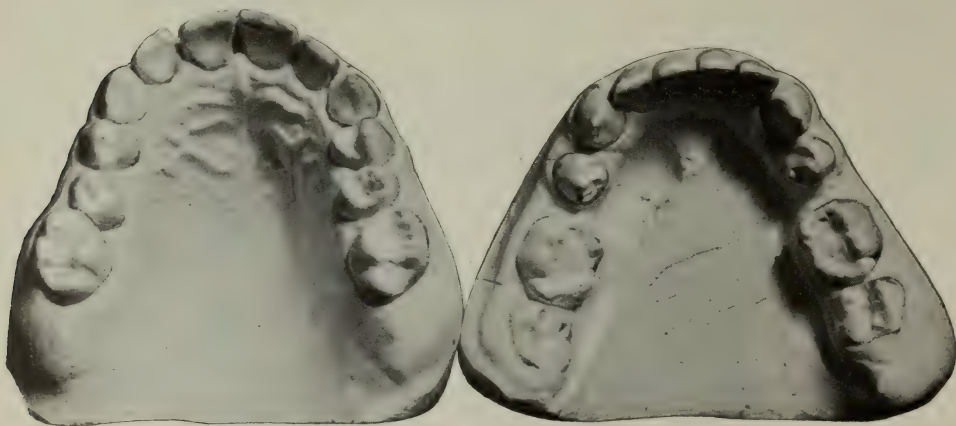
FIG. 32.



From plaster casts taken from patient shown in Fig. 31.

molars, which are, however, ready to erupt. In the lower jaw they are all through except the second premolar. The space for this tooth is very narrow—in

FIG. 33.



From plaster casts of patient shown in Fig. 31.

pearance of this profile one would judge that the teeth and alveolar processes were undeveloped, and probably some of the teeth unerupted.

Fig. 32 is a side view of a plaster cast of the teeth and alveolar processes. The teeth are undersized, the incisors and ca-

fact, not sufficient to allow it to take its proper place in the jaw. The description of the teeth of one side of the jaw may also be applied to those of the other side.

Fig. 33 shows the occluding surface of the upper and lower teeth. It will be noticed again that the teeth are small

and the second premolars of the lower jaw are missing.

Fig. 34 is from a beautiful skiagraph taken by Dr. Kassabian, of Philadelphia, showing the right half of the mandible of the same patient. It will be noticed that the lower second premolar is impacted; it slants backward, abutting against the anterior surface of the first

second molar have the appearance of being bifurcated, when in reality this apparent bifurcation is caused by the non-completion of the apices of the roots.

This is a most interesting case to the orthodontist. As the patient is young and the alveolar processes are in the formative stage, some method must be devised which will assist the teeth and their

FIG. 34.



From radiograph taken from patient shown in Fig. 31, showing impacted lower second premolar and the germ of the lower third molar within its capsule.

molar. If the cancellated tissue in the region of the premolar has become solidified and attached to the cortical bone, this impacted premolar will, to a certain extent, prevent the first and second molars from advancing; these in turn will have a strong tendency to cause the impaction or malocclusion of the third molar. The developing crown of this tooth is plainly seen within its capsule, just posterior to the roots of the second molar. It will be interesting to note that the roots of the impacted premolar and the

alveolar processes to move forward, thus liberating the two second premolars and allowing them to erupt into the line of occlusion. It will be necessary at the same time to exercise the greatest care that nothing be done which would prevent the third molars from developing and taking their proper positions. It is more than likely that the incisors and canines will have to be carried out to a certain extent before the lower teeth can be moved to their proper occluding line.

THE PATIENT'S PART IN KEEPING THE MOUTH CLEAN.

By WM. J. TURNER, M.D., D.D.S., Brooklyn, N. Y.

(Read before the New York State Dental Society, at its annual meeting, Albany, May 13, 1904.)

A MOUTH always clean—clean not only for short periods immediately following visits to the dentist, but continuously clean—is so conducive to the comfort and well-being of the individual that it is of the utmost importance for everyone to know and use all possible means to maintain the mouth in such condition. This presupposes duties other than the dentist's. After he has done his part, much necessarily remains with his patients. Their mouths are immediately under our care for a comparatively short time in the year, the care of them for the remainder of the year being with the patients themselves. The dentist may be most painstaking and thorough in his work, but the result will be much influenced by the quality of the after-treatment by the patient.

And here it is well to bear in mind the disposition of the patients, as to their willingness or otherwise to exercise proper care. Some are unwilling to take much trouble in caring for the mouth, while others are anxious to do everything in their power. Some, again, are skilful, while others are clumsy in employing the means recommended by the dentist. It is well, therefore, to know your patient in this respect, and to treat and direct him accordingly, so that his efforts may produce the most good.

Very few persons from actual knowledge know the true condition of their mouths. The majority think they have done everything necessary when they have used the tooth-brush. They brush their teeth from habit, and do not always appreciate the necessity of thoroughness. How many take a hand-glass, and in a strong light look into their mouths and examine them thoroughly? Frequently

it is with the utmost surprise that, seated in our chairs, they realize the insufficiency of their care, as we point out to them the unclean conditions of their teeth. We all know that the sense of touch in the point of the tongue is extremely acute, and that it ought to be a pretty good guide as to the presence of foreign matter in the mouth or adherent to the teeth. Long presence of abnormal conditions, however, so familiarizes the tongue with the unnatural, that the smooth teeth and clean mouth left after the dentist's ministrations would more quickly be noticed by the owner than would be the deposits of tartar and filth.

Starting with the teeth polished and the mouth cleaned by the dentist, it should not be difficult, in the great majority of cases, for patients to maintain about that condition until their next visit. It is not the purpose here to consider pathological conditions, but merely the care of the mouth in health. In entirely normal conditions the natural movements of the tongue, lips, and cheeks, together with thorough mastication of food, are about sufficient to remove débris of food and all foreign particles, leaving the parts about as clean as before eating. We see people, too, in whom such a state is approximated. They take no unusual care, or no care at all, and yet their mouths are models of cleanliness. Other individuals present with mouths showing all grades from this perfection to absolute filth. As there is a cause for everything, it is well to look for one here, and I am convinced that it will generally be found that in the latter cases it is due to a restriction of the normal movements of the lips, cheeks, and maybe the tongue. Foreign particles, either

loose in the mouth or adherent to the teeth, are usually annoying and give rise to efforts at removal both by the tongue and the muscles of the lips and cheeks. Where collections occur it will be found that these parts are not moved much; the lips and cheeks are kept in contact with the teeth and gums without much sliding over them. The tongue does not find its way into the space outside of the teeth, and the cheeks are never distended by air or fluids to break up that contact and expel whatever may be there lodged.

Our best remedy for this condition is something that will encourage the natural movements of the parts, and nothing else, I think, will do this so well as a mouth-wash. Mouth-washes have been much decried, but I am sure this is because their exact usefulness has not been appreciated, and because they have been improperly used. Their main purposes are to wash out and remove foreign particles from the out-of-the-way recesses or folds where they might otherwise be retained, and to form the habit of free movements of the movable parts in and about the mouth. To accomplish this they must be used copiously, good big mouthfuls at a time, and retained as long as possible—five minutes at the least—while they are moved freely about by alternately distending and drawing in the cheeks, preferably keeping the teeth shut so that the fluid will pass through their interspaces. It will be found that facility in doing this will quickly increase, so that soon it will not be difficult to keep this up for the required length of time. Simply taking in a small quantity of the liquid and almost immediately ejecting it, as almost everyone naturally does, is merely a waste of time and material, and this practice with its negative results has caused the disrepute of this most efficient therapeutic means. In giving directions we must recognize the universality of this inefficient method, and be as emphatic as we possibly can, both in insisting on the correct method and in making thoroughly understood the utter uselessness of anything short of it.

From these principles we see that the composition of the wash is a matter of no

great importance except in a negative way. It should contain nothing harmful to the teeth, as acids; neither should it have anything irritating to the soft parts, or poisonous to the general system in the event of swallowing a portion. As its object is to remove material that can putrefy or ferment rather than to disinfect such material, it is not necessary that it contain powerful disinfectants. However, as the cavity of the mouth with its contents is so complex that it is impossible to absolutely clean it, a good antiseptic principle in the wash is a very desirable feature.

There are other measures familiar to all and used by all, and it only remains to be sure that the most approved materials are secured and that the most effective methods are employed. As to the tooth-brush, as a rule all modifications of the brush in which long and short bristles are generally interspersed, or in which the bristles are arranged in tufts to supposedly conform to the depressions and elevations of the teeth in the arch, are, in the writer's opinion, unsuitable. The interproximal spaces are not equidistant from each other, and even if they were, the manner in which the brush is used would cause the corresponding surfaces of the teeth and brush to be many times out of harmony for every time they were in harmony. Besides, any brush, the bristles of which will not reach into the contact points of the teeth is too stiff and should be discarded. The bristles should all come to the surface, which should be slightly concave from heel to end, and somewhat longer at the end to reach behind the third molars and to the back of the front teeth.

To thoroughly and effectively use the brush is a nice operation, one that does not require much time, but that does call for considerable care and skill. We know that in the finishing of a set of artificial teeth the fine work and skill of the expert is shown not only in the broad and easily reached surfaces, but also in the out-of-the-way parts that are difficult of access—such as between the teeth and the inside of clasps. So it is with cleaning the natural teeth; the gingival margins and

the approximal surfaces must receive especial attention. To most thoroughly brush all surfaces of the teeth that can be reached and at the same time without injury to the soft parts, the stroke must be in one direction only—starting on the gum, going parallel to the long axis of the tooth toward the opposite jaw. This friction will be found beneficial to the gum, and the cervical margins and much of the approximal surfaces of the teeth will be reached.

As plain water is not sufficient to perform the proper toilet of the hands, but must be supplemented by soap, so the aid of a dentifrice is called for in the care of the teeth. The certain definite properties that it should possess have been plainly laid down by Professor Long in his work on "Dental Materia Medica, Therapeutics, and Prescription-Writing." Quoting from him these are—"First, antacid; second, slightly abrasive (just sufficient to prevent accumulation of deposits); third, aseptic or antiseptic; and fourth, pleasant to the taste." These are all self-evident requisites and need no comment, with the possible exception of the second. Often too much emphasis is placed upon the word "slightly" modifying the word abrasive. Prepared chalk is fully abrasive enough for most cases, but where accumulations still occur in too great quantities, in spite of proper methods, there should be no hesitation in adding the still greater abrasive quality of finely powdered pumice, care being taken not to have more than necessary. Where too gritty powders or pastes have been used, their wearing action has been manifested in certain prominent places, especially on the canines, where vigorous cross-brushing has left its mark. The faulty method of brushing here, however, is as much to blame as the character of the dentifrice.

Notwithstanding the faithful carrying out of these details, close examination will generally disclose some surfaces of the teeth—as evidenced by stain—that

have not been properly cleansed. From this arises the desirability of careful examinations with the hand-glass before a strong light, such stains being noted and removed by the aid of pumice stone and an orange-wood stick. Also, the location of such spots being known, endeavor is made to do more thorough work with the brush, looking to the avoidance of having any such uncared-for surfaces.

As brushes do not reach the entire approximal surfaces of the teeth, and as mouth-washes will not remove all foreign matter that becomes lodged between the teeth, recourse must be often had to other means. These consist of the various forms of tooth-picks and floss silk. While these are frequently invaluable and serve a most useful purpose, their unskilful or careless use often causes the gravest trouble. Their impingement upon the gum may, and often does, give rise to considerable irritation, followed by recession and formation of pockets. If the silk is used the fingers must be braced in such a manner as to prevent its being forced into the gum after passing the contact points of the teeth; and if tooth-picks are employed they must be flat and very thin, and of a hard and firm enough texture to hold their shape and size without disintegration. Quills or orange-wood answer these requirements better than anything else. It must be remembered that spaces do not normally exist between teeth. Teeth should have firm points of contact with their neighbors, beyond which points space should be obliterated by gum tissue. This gum tissue is easily irritated if subjected to pressure from which it is normally protected by the teeth, and such irritation results in recession, the formation of pockets, and the spreading of the teeth, a most annoying condition, with a tendency to grow worse. Hence the necessity of exercising the greatest care in passing anything into these spaces, and the inadvisability of doing so at all unless the necessity is apparent.

RECENT METHODS IN THE ADMINISTRATION OF ANESTHETICS.

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(Read before the Massachusetts Dental Society at its annual meeting. Boston, June 1, 1904.)

MR. PRESIDENT, ladies, and gentlemen of the Massachusetts Dental Society: It is a great pleasure to speak to you upon this subject, because members of your branch of the profession have always been prominently associated, not only with the discovery of anesthetics, but with promoting the scientific use of them.

HISTORY OF ANESTHESIA.

You know that Horace Wells, a dentist living in Hartford, Conn., first used nitrous oxid as an anesthetic in 1844, and that in 1864 Dr. Colton, a New York dentist, continued the use of gas which had practically ceased with the death of Wells in 1848. You know also that Dr. Morton, a Boston dentist, first administered ether in 1846 at the Massachusetts General Hospital, and the names of Carlson, a German dentist, and Billeter, a Swiss dentist, are associated with the first considerable use of ethyl chlorid as a general anesthetic in 1897.

Since the discovery of these various agents very many of the improvements in method and apparatus for administering them have come from members of the dental profession.

During the ten years that followed the discovery of gas by Wells, and of ether by Morton, no progress in method and apparatus was made; but in 1858 Dr. John Snow of England did some work on the physiological action of chloroform and ether and devised inhalers for their administration.

Still more important work was that of Mr. J. T. Clover, of London, who in 1862

invented a regulating chloroform inhaler, and in 1876 demonstrated the advantage of using gas as a preliminary to ether.

In recent years Dr. Frederic W. Hewitt of London has done much to promote the scientific administration of anesthetics. His most important work, begun in 1886, was the administration of nitrous oxid with definite percentages of oxygen, and in 1894 he perfected an excellent apparatus for this purpose. So although Americans discovered gas and ether, yet it appears that since 1858 until very recently most of the literature of anesthesia and many of the improvements in method and apparatus have come from England. I think the reason for this is the discovery of chloroform by Sir J. Y. Simpson in 1847. Chloroform was found to be a valuable but dangerous anesthetic, requiring more caution in its administration than gas or ether. The English investigators began by inventing methods and apparatus for the safe administration of chloroform, and in so doing their attention was attracted to similar improvements in gas and ether. It became evident to professional men in England that the administration of anesthetics was too important to be intrusted to inexperienced persons, and men began to devote themselves entirely to this work, with the result that anesthesia became more systematized than in America.

Since the days of Clover the number of professional anesthetists in England has greatly increased. Today, in the dental and general hospitals of London, anesthetics are administered almost entirely by professionals. Anesthesia is systematically taught in the medical

schools, and students are required to pass examinations and receive practical training in this work before graduation.

Different anesthetists hold different appointments just as do surgeons; thus Dr. Frederick W. Hewitt is anesthetist to His Majesty the King, anesthetist and instructor in anesthetics at the London Hospital, anesthetist at Charing Cross Hospital and at the London Dental Hospital.

There are societies of anesthetists who hold regular meetings devoted to the science of anesthesia; thus Dr. Dudley Buxton is ex-president of the Society of Anesthetists, administrator of anesthetics and lecturer in the University College Hospital, consulting anesthetist to the National Hospital for Paralysis and Epilepsy, and senior anesthetist to the Dental Hospital of London.

Many London anesthetists are men well advanced in years. Dr. Buxton, for instance, is fifty or fifty-five years old, with gray hair and beard, but well preserved and active, and I remember well at the Middlesex Hospital in London a Mr. Norton, who must have been sixty-five years old and who was a careful and skilful anesthetist, equal to any emergency.

So, although the most useful and important anesthetics were discovered in America, they were elaborated in England.

In recent years, however, American investigators have taken up this line of work. In 1889 Dr. Thomas L. Bennett, now of New York but then of Denver, Colorado, began to investigate the subject of anesthesia. He used a Clover inhaler for several years, but finally invented his combined gas and ether inhaler, which is far ahead of anything any country has produced for this purpose. He was, I think, the first professional anesthetist in this country, and has been practicing this line of work in New York since 1897. Dr. Bennett has had many imitators—of whom I am one—and interest in anesthesia has gradually increased; as yet, however, the anesthetist's profession in this country is not an overcrowded one.

ANÆSTHETICS IN CURRENT USE.

The anesthetics in common use today are nitrous oxid, ether, chloroform, mixtures of chloroform and ether, and ethyl chlorid. In considering these agents in detail, the most important thing is the question of their safety, which it can do no harm to review.

Of all agents, *nitrous oxid* as ordinarily used is the safest. Considering the innumerable times that it is given, both in this country and in England, exceedingly few deaths are reported. It is considered so safe that most writers make no attempt to estimate its safety in figures. I have seen somewhere its death-rate given as one in two hundred and fifty thousand.

Nitrous oxid and oxygen is a still safer form of anesthesia, when limited to short operations, but lately anesthetists, especially in this country, have undertaken to use gas and gas and oxygen for the longer major surgical operations, and have reported administrations of from thirty minutes to two hours and a half.

When thus used the danger of gas, or gas and oxygen, is very materially increased. I have seen very alarming symptoms occur, and on one occasion almost lost a patient under this form of anesthesia. In certain special cases of advanced renal and cardiac disease, however, it gives the patient the best chance, especially if the operation is one which does not require muscular relaxation. My longest case was one of forty-five minutes, the operation being dilating and curetting, ventral suspension, and appendectomy. For long operations, however, I have come to regard this form of anesthesia as treacherous and as less safe than chloroform.

Ether. Next in safety to gas comes ether. Excepting in people who are distinctly feeble or diseased, ether is perfectly safe. In ether accidents the respiration always fails before the circulation, so that if taken in time and persisted in long enough, artificial respiration will almost always save such cases. The most reliable statistics give the death-rate from ether as one in sixteen thousand.

Chloroform. Chloroform is the most dangerous of all anesthetics. Besides being a direct cardiac depressant, it has a tendency to cause irregularities in respiration which react upon the heart. These irregularities are seen mostly in the lighter degrees of chloroform anesthesia and may be produced by reflex causes. During the stage of excitement the respiration is especially irregular, and the patient may suddenly, with a deep inspiration, inhale an overdose; any interruption of respiration during chloroform anesthesia is therefore dangerous, as the chloroform already in the lungs becomes incarcerated and reacts upon the heart. Reflex causes, such as operative procedures, are apt to produce temporary arrest of breathing and consequent danger, but, as reflexes are more active during a light anesthesia, a deep chloroform narcosis is in some ways safer than a light one; for this reason chloroform is particularly dangerous in mouth, nose, and throat operations, since respiration is very apt to be interfered with in these cases.

Chloroform is especially unsafe when given to a patient who is sitting upright, besides being a cardiac depressant it is a vaso-dilator and allows the blood to gravitate from the great centers in the medulla into the dilated splanchnic vessels. Again, although a deep chloroform narcosis is, as I have said, in some ways preferable to a light one, it has the danger of overcoming the heart by an overdose, so chloroform is dangerous from any point of view. Its death-rate is estimated as one in three thousand.

Mixtures. I consider mixtures containing ether and chloroform just as much safer than pure chloroform as they contain more ether than chloroform, provided they are administered with certain precautions which tend to produce an even evaporation of their ingredients; thus Schleich's mixture No. 3, containing—Petroleum ether 15 volumes, chloroform 13 volumes, and ether 80 volumes, is comparatively safe if given with ordinary precautions, owing to the preponderance of ether in it. When a house officer at the Massachusetts Gen-

eral Hospital I gave this mixture for two months as a routine anesthetic; I had two or three accidents, but no deaths. The English A. C. E. mixture containing—Alcohol 1 part, chloroform 2 parts, ether 3 parts, is safer than pure chloroform, though not so safe as Schleich's No. 3.

The best and safest mixture that I know of is the "Anesthol" recently introduced by Dr. Willy Meyer of New York. This contains approximately—Ethyl chlorid 1 part, chloroform 2 parts, ether 3 parts, and is said to be a true molecular mixture, having a boiling-point of 40° C.; this secures the almost simultaneous evaporation of the three drugs and adds materially to the safety of the mixture. Mixtures are not used enough for valuable statistics to be prepared in regard to them. I think they are safer than pure chloroform, although not so safe as ether.

Ethyl chlorid has lately become popular as an anesthetic. The most reliable statistics place its death-rate as one in sixteen thousand, but as it has not been used nearly as long as other anesthetics, statistics in regard to it have not much weight. It is analogous in its action to gas, and my limited experience with it leads me to believe that it is safe if restricted to short operations. It does not produce cyanosis, but seems at times to have a slight depressing effect upon the circulation, especially during the first part of the administration. If we accept its death-rate as one in sixteen thousand we find it safer than chloroform, as safe as ether, but not so safe as gas.

Following is the order of safety of the anesthetics we have been reviewing:

- (1) Nitrous oxid and oxygen (when limited to short operations).
- (2) Nitrous oxid.
- (3) Ether.
- (4) Ethyl chlorid.
- (5) Mixtures.
- (6) Chloroform.
- (7) Nitrous oxid and oxygen, when used in long operations.

Deaths occurring under anesthetics should always be reported promptly and in full detail, as this is the surest way

of determining the safety of any anesthetic.

But simply because one agent is statistically safer than another it should not be arbitrarily used in preference to that other, nor should any one method, such as giving morphin and atropin, be recommended as a routine procedure. As in other branches of medicine, different patients require different agents and methods, and the anesthetist, having carefully examined his patient, must select and vary his treatment according to age, sex, disposition, habits, condition of the heart, lungs, etc.

To meet the indications of various cases anesthetics are administered "in sequence," as it is called; for example, we use the *gas-ether* sequence, the *ethyl-chlorid-ether* sequence, the *anesthol-ether* sequence, or the *gas-ether-chloroform* sequence.

Besides the proper selection of the anesthetic, the anesthetist must concern himself with many details, such as the influence of posture upon the respiration and circulation, the proper protection of the patient during operation against drafts, pressure paralyses, etc., and must attend to the proper stimulation of the patient in case of necessity. He should be held entirely responsible for the safety of the patient as regards the anesthetic.

PRACTICAL POINTS IN ADMINISTRATION.

I will now speak of some practical points in the administration of these agents.

Gas. Gas is so easily eliminated that in order to be effective it must be made to replace the residual air in the lungs and the access of fresh air must be cut off for the time being. In other words, to produce the best results pure gas and no air must be given, at least for the first part of the administration. The practical difficulty that we encounter in giving gas is not from giving the patient too much gas, but from giving too much air, thus delaying anesthesia. Therefore, in order to be effective, the gas machine must be so made as—(1) To keep out air, (2) To replace residual air in the

lungs with gas, (3) To keep a certain amount of gas constantly in the lungs.

The simplest and most effective form of apparatus for this purpose is the one ordinarily seen in the dentist's office where much extracting is done. Gas is liberated from a cylinder and enters a long tube of large caliber which ends in a mouthpiece. This is placed in the patient's mouth and the lips are closed over it. If the nose be also closed the patient inspires pure gas; if the nose be not closed he inspires gas plus a small amount of air; during expiration, air plus a certain amount of gas passes through the nose; thus with each inspiration the patient gets more gas; with each expiration he loses more air, so that gas gradually replaces air in the lungs and anesthesia rapidly results. When the inhalation is stopped there results an anesthesia of varying duration which is called the "available" or working anesthesia. This apparatus is simple and effective, but is not portable, and is suited only for dentistry.

The same result is accomplished in other forms of apparatus which have closely fitting facepieces to exclude air, and inspiratory and expiratory valves; the best form of such an apparatus is Bennett's gas inhaler. Gas is liberated from a cylinder and conducted by a rubber tube to a distensible rubber bag of about two gallons capacity; the closely fitting facepiece is accurately applied, gas is liberated from the bag and is inspired by the patient through the inspiratory valve; the patient expires through the expiratory valve, the expirations going into the surrounding air and no fresh air entering the lungs during inspiration, the expiratory valve being closed. In this way gas is made with each inspiration gradually to replace the residual air in the lungs. When signs of approaching anesthesia occur the gas may be shut off and the valves thrown out of action by turning the stopcock; the patient breathes back and forth into the bag. The result of this, however, is not asphyxiation, but delaying of asphyxiation, because the patient is breathing a mixture of gas plus what residual air

is left in the lungs; whereas, if he had been permitted to go on breathing gas through valves, the gas would have replaced all the air in the lungs and asphyxia would result, so this maneuver of throwing the valves out of action delays asphyxia and also results in a longer available anesthesia, because as a rule the longer the inhalation the longer the available anesthesia. (Demonstration of Bennett's Gas Inhaler.)

For dentistry, perhaps, this form of apparatus presents little advantage over the simpler form that I at first described. For the longer surgical operations it presents distinct advantages; in the first place, the bag, being near the facepiece, offers no mechanical impediments to respiration; in fact, by keeping the bag well filled a constant positive pressure is kept up which keeps a steady stream of gas flowing into the lungs without much inspiratory effort on the patient's part. The vents for the admission of air enable us to keep the patient under, and at the same time to admit such small definite quantities of air as are necessary to prevent too much cyanosis. In using this machine the most essential point is to select an accurately fitting face-cushion, as even very small amounts of air admitted during the first part of the inhalation will spoil a good gas administration.

It is possible to give gas with suitable proportions of air for long operations, but it usually produces an unsatisfactory form of anesthesia owing to the lack of muscular relaxation and the asphyxial symptoms that occur with it. Without discussing the physiological reason for this, the clinical fact is that it is not possible to give enough air with gas to dispel these asphyxial symptoms and at the same time to control the patient. My longest case of gas-and-air anesthesia was a nephrectomy lasting thirty-five minutes.

Other methods of giving gas in which you may be interested are—(1) Dr. Flux's open method; (2) Dr. Patterson's apparatus for giving gas in long operations on the mouth.

In Flux's method an open cone made

of glass or celluloid with an accurately fitting inflatable rubber cushion is used. Gas is allowed to flow into the top of this cone during inspiration only, and being heavy it sinks at once to the bottom of the cone and is inhaled. In timid persons and children this method is said to produce a tranquil and satisfactory anesthesia without cyanosis; it consumes a great deal of gas, however, and does not seem to me practical.

Patterson's apparatus I have seen used at the London Dental Hospital. It consists of a gas cylinder with a foot-key by which gas is liberated through a long rubber tube into a rubber bag of four gallons capacity; at the top of the bag is a stopcock which turns on gas or air as needed. From the stopcock two tubes lead to the nosepiece fitted with an inflatable rubber cushion to permit of closer approximation. This is closely applied over the nose and the patient breathes gas. Anesthesia takes a little longer by this method owing to the air inhaled through the mouth; if more rapid anesthesia be desired there is a separate mouthpiece fitted with an expiratory valve by which the patient gets no air and the anesthesia results more rapidly. With the nosepiece only, anesthesia results in about forty seconds; using the mouthpiece also, in about fifteen or twenty seconds; eight or ten gallons are used for an ordinary administration, and twenty or thirty gallons lasts ten or fifteen minutes.

An important advance was made in 1894, when Hewitt perfected his apparatus for the administration of gas with definite percentages of oxygen. You know that nitrous oxid is a pure anesthetic and is not dependent upon asphyxia for producing its results; this is proved by the fact that by admitting definite percentages of pure oxygen it is possible to keep patients deeply and quietly anesthetized for long periods of time without any asphyxial symptoms. A suitable patient under this form of anesthesia appears to be sleeping peacefully with normal or slightly improved color and tranquil or gently snoring breathing; it gives a longer available anesthesia in dentistry than does pure gas.

Ether is commonly administered in one of two methods: the semi-open method, and the closed method. The semi-open method is the one ordinarily seen in hospitals, and consists in giving ether on a cone made of tin or pasteboard. The pasteboard cones are the best as they can be accurately fitted to the face. This method is the best for persons who are not experts, but it requires large amounts of ether unless the cone is accurately molded to the face so as to exclude air.

The principle of air limitation in giving ether was expounded by Clover in 1876, when he invented his inhaler. This is known as the closed method, and in experienced hands is much more practicable than the open method, because it requires very much less ether and the proportions of air and ether vapor are under perfect control. The result is that patients are less apt to become "soaked" with ether, and recoveries are much more rapid and free from nausea and vomiting. Bennett's ether inhaler is the best type of the closed inhaler; with it suitable patients can be comfortably and safely anesthetized with ether in from two to five minutes, and the entire apparatus can be boiled and sterilized without damaging it. (Demonstration of Bennett's Ether Inhaler.)

A third and exceedingly useful method of giving ether is by the apparatus invented by Dr. Fillebrown of Boston. In dental and oral surgery it is necessary to give ether with the mouth open in order that the surgeon may work while the anesthesia is being continued. Ether as ordinarily used could not control the patient in the presence of so much air; nor is chloroform safe for such cases, owing to the danger connected with giving this direct to patients in the sitting posture. Dr. Fillebrown's apparatus heats the ether, thus doubling the rate of its evaporation and intensifying its strength so as to make it effective with large amounts of air. His original apparatus was modified by his assistant, Dr. Rogers, and still further improved by Mr. Lockwood of Boston. It is exceedingly practical in head cases of all kinds, and will control

very difficult subjects. (Demonstration of apparatus.)

Gas and ether, or the gas-ether sequence, is much used in surgery. When properly administered it is a great comfort to both patient and surgeon. Instead of ten or fifteen minutes of struggling, shrieking, coughing, retching, and vomiting, the patient may be safely plunged into a profound anesthesia in two minutes. English statistics estimate the safety of gas and ether as greater than that of ether alone. When gas is used there is much less nausea and vomiting and a more rapid recovery; the patient is spared all the suffocating sensations so often produced by ether alone. This method is useful in dentistry because it is safe in the sitting posture and will give an available anesthesia which may be anywhere from four to ten times as long as that resulting from gas alone, and a recovery which is often unattended by nausea and vomiting. (Demonstration of Bennett's Combined Gas and Ether Inhaler.)

The principles of giving chloroform are exactly the opposite of those for ether. It must, under all circumstances, be administered with large amounts of air, as it is easy to give an overdose. Chloroform is best given on an Esmarch or Schimmelbusch mask, using a drop-bottle and the constant drop method. It can also be satisfactorily given on a small square piece of folded gauze, by the so-called Scotch method, which consists in shaking on comparatively large doses of chloroform at intervals. For dental and oral surgery, tracheal chloroforming, etc., many regulating chloroform inhalers have been devised. A good one is Krohne's "regulating inhaler." (Demonstration of Krohne's Regulating Inhaler.)

Mixtures, according to the amount of chloroform they contain, should be given with more or less air; thus the English A. C. E. mixture, having two parts of chloroform and three of ether, should be given as chloroform, while Schleich's mixture No. 3 can be given on a cone or other form of semi-open inhaler. As I mentioned before, the danger in mixtures

is the different rates of evaporation of their ingredients, but if the mixture has a definite boiling-point and is administered by the drop method this danger is practically *nil*.

I have had considerable experience with mixtures and consider them safer than chloroform.

Much has been written lately about ethyl chlorid, which until 1897 was used only as a local anesthetic. Ethyl chlorid is exceedingly volatile, has a low boiling-point—that is 12.5° C.—a slight, rather oniony odor, and is inflammable. It is sold in graduated glass vials with patent stoppers under various proprietary names. The commonest kinds are “Antidolorin,” “Anaestile,” “The Cleveland Gas Company’s Agent,” “Kélène,” and “Narcotile.” Of these I have found that kélène and narcotile give the best results, and I have used narcotile more than any other.

Ethyl chlorid is analogous in its action to gas, producing its effects more rapidly and being very rapidly eliminated. It must be given on the same principle as gas, namely, with almost complete exclusion of air. Ethyl chlorid is useful, and I believe safe, in slight operations that do not require muscular relaxation nor a deep anesthesia. I believe it has been found by American practitioners to be unsatisfactory in dental surgery on account of the short available anesthesia that it produces. Dr. Thos. D. Luke, of Edinburgh, however, reports a series of dental cases in which the available anesthesia varied from one to five minutes, which is longer than that produced by gas. It does not produce cyanosis, but will not abolish the higher reflexes nor

produce muscular relaxation. My longest case with it was one of forty minutes, given for an orthopedic operation on the ankle-joint. This anesthesia was very ragged and was followed by intense and persistent nausea and vomiting. My experience with this drug is limited to about sixty cases, which, I regret to say, I did not record systematically, but many of them were followed by nausea and vomiting.

Since many writers, carried away by enthusiasm for ethyl chlorid, have claimed that it is superior to gas and will supplant gas, it may be profitable to compare the two. Ethyl chlorid, though it seems to be safe, is not so safe as gas, and has not been put to anything like the test for safety that gas has, only having been used since 1897. Ethyl chlorid is not so agreeable to inhale as gas; gas has more of a taste than an odor, and patients who have taken both have assured me that they preferred gas. Recoveries from ethyl chlorid are much less satisfactory and much more often attended with headache, nausea, vomiting, and a dazed condition of the mind than are recoveries from gas, in which the patient is usually free from nausea and vomiting and perfectly normal at once. So, although ethyl chlorid produces no cyanosis, is perhaps less expensive, is more portable, and requires less skill to administer than gas, yet these trifling advantages should have no weight in the face of the three facts I have just mentioned. It may be used to precede ether, but in this respect, also, is inferior to gas. (Demonstration of Ware’s Inhaler and Ash & Sons’ Inhaler.)

THE ALVEOLO-DENTAL MEMBRANE: ITS MINUTE STRUCTURE FROM A PRACTICAL STANDPOINT.

By I. L. M. WAUGH, D.D.S., Buffalo, N. Y.

(Read before the New York State Dental Society, at its annual meeting, Albany, May 13, 1904.)

IN presenting my subject, "The Alveolo-dental Membrane: Its Minute Structure from a Practical Standpoint," I am fully aware that I have chosen a topic that is very broad and one which has frequently been before you. We are told that "The world does not require so much to be informed as it does to be reminded." I shall not attempt to offer you anything that is new, for the sufficient reason that there is little or nothing very new concerning the intricate make-up of this structure. The excellent work of Dr. G. V. Black entitled "The Periosteum and Peridental Membrane," published in 1887, stands today, except for possibly trivial modification in one or two minor points. The authors of more recent works on this subject have drawn very heavily on Black for both illustration and subject-matter.

You will, no doubt, concede that a full knowledge of the minute structure of any tissue in health is essential to its most intelligent treatment in disease. I shall concisely review the histology of the alveolo-dental membrane, and shall endeavor to call attention to its practical bearing in a few of the more important considerations which concern us in our everyday work.

The alveolo-dental membrane is the connective tissue layer which serves to invest the root of the tooth and line its alveolus. The origin of this tissue is from the outer layers of the dental sacculus.

It varies markedly in thickness in different teeth and in different parts of the same tooth. It is thickest at the cervical portion, becoming thinner in the

middle part of the root, again increasing toward the apex, where it assumes a considerable thickness. In the normal tooth, and some pathologic conditions, it is generally more closely adherent to the cementum than to the alveolar wall. The removal of part of the alveolus in tooth-extraction is frequently due to this condition. It is rich in nerves, blood-vessels, lymphatics, and glands. It is thicker, more highly vascular, and of greater elasticity in youth. After middle life it gradually loses these qualities, until in old age the tissue has undergone modification to a marked degree.

FUNCTIONS OF THE PERICEMENTUM.

Its duties may be divided into three classes: (1) Functional; (2) Physical; and (3) Sensory.

The *functional* embrace (a) its nutritive and (b) its formative duties. It nourishes the cementum, and in part the alveolar wall through the agency of its copious vascular supply. (b) Its formative function is that of building bone on one side and cementum on the other. This is performed through the agency of certain of its cells.

The *physical* office is (a) that of retaining the tooth in its socket; and (b) its cushion action. These are effected by the principal fibers of the membrane.

The *sensory* function is brought about through the agency of the nerves which abundantly supply the tissue.

This membrane and its product, the cementum, are the only *true* tissue formations entering into the make-up of a human tooth. The essential elements

of a tissue are (a) cells and (b) intercellular substances properly intermingled. In enamel and dentin there exist no living cells. In the dental pulp there are cells and intercellular substances, but these are not sufficiently formed or properly associated to constitute a true tissue.

ITS CELLULAR CONSTITUENTS.

The cells are (a) osteoblasts, (b) cementoblasts, (c) fibroblasts, (d) osteoclasts, (e) epithelial cellular bodies, the function of which is yet imperfectly understood.

Osteoblasts are active in the formation of a portion of the alveolar wall. They are found on the outer or bone surface of the membrane, intermingled with its principal fibers. They are much more abundant during the development of the alveolar wall, and at this period are closely packed over the whole surface; but as age advances they diminish in number and size and become separated into groups.

This has a practical bearing in the extraction of misplaced teeth, as for example when found upon the hard palate, in the nasal cavity, in the floor of the mouth, etc. It has been claimed by some that the removal of such teeth is accompanied by grave danger of seriously injuring surrounding parts, as tearing out the bony structure of the hard palate, or if in the nasal cavity, the removal of part of its floor or bony walls, etc. There is an alveolus formed wherever a tooth is erupted. With reasonable precaution serious accident need seldom be feared, as the alveolus is amply resistant and sufficiently strengthens surrounding bony parts to reduce the danger to a safe minimum.

Cementoblasts are irregular cells found on the opposite side of the alveolo-dental membrane from the osteoblasts. They also lie between the principal fibers, forming a closely packed layer, which persists, the cells not separating into groups. There is an almost constant variation in quantity of the cementum of the same tooth within physiologic limits.

In the extensive moving of a tooth, as in orthodontia, there is partial resorption of the cementum in the area upon which great pressure is brought. A building up of this tissue takes place in the zone of attachment of the principal fibers which are put under tension, or in other words, those which directly resist the movement of the tooth.

The cementum remains alive so long as its surrounding membrane is vital. In fact, all of the enamel and nearly all of the dentin may be removed and yet one may by judicious treatment build upon the remaining remnant of the tooth an artificial substitute which, with ordinary care, will do excellent service for many years. When the alveolo-dental membrane is once destroyed the tooth is lost, no matter how nearly perfect may be the other tooth-structures.

Fibroblasts are spindle-shaped cells which are active in the increase and renewal of the fibrous elements. They are distributed to all parts of the membrane and are constantly undergoing change.

Osteoclasts are large multinucleated cells whose function it is to disintegrate calcified tissue when that becomes necessary, as in change of occlusion, whether due to an effort on the part of nature to duplicate a type, or to extraction of surrounding teeth, orthodontia, etc. They are followed by the α "blasts" or builders of the respective hard tissue. They are probably almost constantly at work to at least a slight degree.

FIBERS.

The principal fibers are the elements which actually hold a tooth in its socket. Their course varies greatly in different parts, and, considered as a whole, their arrangement is complex. They are of the white fibrous variety of connective tissue, the elastic being absent or, if present, are in such minute quantity that attempts at their demonstration have so far been unsuccessful. They extend from the cementum on one side to the alveolar wall on the other. They pass directly into these hard structures

for a variable distance at either extremity, by this means strongly suspending the tooth in its socket. The portion of the fibers which penetrate the calcified tissue are known as "Sharpey's fibers." While in general the direction of the fibers may be said to be transverse, their course varies somewhat in different parts. The main bulk lie parallel with one another except where they deviate to make room for vessels and nerves. In the gingival portion they pass out either directly or divide into small bundles of fine fibers. Upon the labial, buccal, and lingual surfaces of the gingival portion they pass directly into the fibrous tissue of the gum. On the mesial and distal surfaces those beyond the alveolar border join with the fibers of the neighboring tooth.

Fibers from this membrane assist in the formation of the free margin of the gum throughout its whole extent. The term "dental ligament" has been applied to this portion.

The fibers near the alveolar margin join with the periosteum covering the outer surface of the alveolar process. The fibers immediately within the alveolus are inclined from the cementum slightly toward the apex, while those of the middle portion of the root pass perpendicularly across. The fibers of this part are the shortest, largest, and strongest. As the apex is approached the fibers on the lateral aspect tend to incline crownward from the cementum. As the fibers pass from the apex they radiate in this portion, frequently breaking up into flattened fasciculi.

The slight normal movement of the tooth in its socket is not due to the elasticity of the fibers, but to their many directions and curving course in some localities, so that very slight movement is possible without any principal fibers being on actual tension. The arrangement of the fibers for the performance of their physical function is the best that could be devised. In studying a longitudinal or vertical section *in situ*, it will be seen that the majority of the fibers pass somewhat obliquely downward from the cementum to the alveolus. It will be noted that the greatest strength is so dis-

posed that it may best resist strain from the occlusal surface and incisive edge, supporting the tooth so as best to prevent injury to the tissues of the apical space. In transverse section it will be seen that the fibers are distributed so as to prevent lateral displacement and rotation. The oblique course of the fibers is more pronounced at the angles, especially the labial, to prevent turning of a tooth in its socket.

In young subjects a large part of the alveolar septa is often wanting, and in that case the fibers pass directly across and unite with those of the neighboring tooth. With increasing age, as the bony development is more advanced, the fibers become surrounded and actually built into the bony structure of the septa.

The question of separation of teeth may here be considered. The lack of extensibility of the fibers is very important. For anatomic reasons, if for no other, when extensive separation is needed it would seem of great importance that the slow method be employed whenever possible, as the immediate method—metallic separators, wooden wedges driven to place, etc.—has been in the past and probably will be in the future the cause of the snapping of these fibers. This is followed usually by permanent separation of the teeth and the formation of pockets between them, due to the degeneration of the alveolo-dental membrane and destruction of the osseous septum. I have seen cases in which the greater part of the septum was destroyed within from six to nine months, and one extreme case in which three teeth, an upper canine and two bicuspsids, were so loosened as a result of the destruction of their alveolar and membranous support that they were simply swinging. The case on ocular examination resembled in every respect the condition of advanced pyorrhea, differing possibly in that much more pus was present. This occurred within fifteen months after separation. The patient was a robust woman, probably about thirty, who had always enjoyed good health. There was no indication of syphilitic taint, and in fact by a process of careful exclusion it was de-

cided that the excessive immediate separation of the teeth for the placing of approximal gold fillings was the direct cause. The teeth were of necessity extracted.

In orthodontia it is found that the movement of a tooth is difficult or easy in proportion to the strength of the fibers which resist its movement. The most difficult is that of depressing a tooth in its socket, while the easiest is the elevating of a tooth, in so far as the disposition of the fibers is concerned. The great length of time necessary for the wearing of retaining appliances in cases of rotated teeth is also explained mostly in this way.

VASCULAR AND NERVOUS SUPPLY.

The alveolo-dental membrane is abundantly supplied with vessels and nerves. These are derived from three sources—(a) the *gingival plexus*, (b) the *alveolus*, and (c) the *apical space*. These form rich capillary networks and nerve plexuses throughout the tissue. The supply from any one source is sufficient to maintain the vitality and sensory function of the structure. The vessels and nerves from the gingival plexus and those from the apical space may be cut off simultaneously and the tissue not suffer from lack of nourishment and sensation. Its rich supply of bloodvessels, lymphatics and nerves renders it capable of ready recovery from injury. This, how-

ever, does not mean that the tissue will readily reconstruct itself when once destroyed. It is questioned whether this tissue ever rebuilds itself when once any considerable area has become devitalized.

Considering its anatomic and histologic make-up and relations, it would seem that the condition of surrounding parts must be of utmost importance. If there has been a considerable destruction of this membrane and the condition continued sufficiently long, as in advanced pyorrhea and alveolar abscess conditions, also in implantation, transplantation, and probably replantation, so that the death of the corpuscles of the outer part of the cementum has taken place, it would seem that one could not expect a return to the original normal condition. The irritating influence may be removed, the surrounding parts restored to as nearly a normal condition as possible, the alveolo-dental membrane freshened surgically and chemically, and treated with mild stimulating disinfectant and antiseptic agents, and brought to fill the space so that a fine exploring instrument cannot be passed into the former pocket to any extent. But to expect an entrance of the fibers into the cemental tissue and complete restoration of original conditions would be expecting something for which there seems to be no provision in nature's kind and wonderful repair shop.

PROCEEDINGS OF SOCIETIES.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-sixth Annual Meeting.

FIRST DAY—*Morning Session.*

THE thirty-sixth annual meeting of the Dental Society of the State of New York was held in the assembly hall of the Hotel Ten Eyck, in Albany, N. Y., May 13 and 14, 1904.

The meeting was called to order by the president, Dr. R. H. HOFHEINZ of Rochester, on Friday, May 13, at 10.30 o'clock.

Prayer was offered by Rev. JOHN H. CLARK of Albany.

After the transaction of some routine business,

Dr. R. H. HOFHEINZ read his annual address.

On motion the President's address was referred to the Executive Council for consideration and action on the recommendations made therein.

Dr. WM. CARR, chairman of the Law Committee, then read his report.

The report of the Law Committee was received and referred to the Executive Committee.

The next order of business was the reading of papers.

The paper by Dr. E. N. JENKINS, Dresden, Germany, entitled "The Advance of Porcelain Restoration in Germany," was read, in his unavoidable absence, by Dr. C. S. Butler. (Printed in full at page 636 of the August issue of the Cosmos.)

Discussion of Dr. Jenkins' paper was

on motion deferred until after the reading of the next paper.

Dr. JOS. HEAD, Philadelphia, Pa., then read a paper entitled "The Aseptic Superiority of the Pin Crown over the Band Crown." (Printed in full at page 539 of the July issue of the Cosmos.)

Discussion of the papers of Drs. JENKINS and HEAD.

Dr. W. D. TRACY, New York. It is certainly with genuine pleasure that I have listened to the expression of Dr. Jenkins' views in regard to the use of porcelain inlays and fillings as a system in the treatment of carious teeth. Four years ago I heard an enthusiastic advocate of low-fusing porcelain state that in a short time high-fusing porcelains would be a forgotten art of the past; but the two schools still exist and both have their stanch advocates.

There are certain features of the Jenkins method that appeal to the porcelain worker as being advantageous, and at the same time he appreciates in the high-fusing system some features that seem equally valuable. A consideration of the relative merits of the two methods at present, however, would be inappropriate. The profession in the United States (with a few exceptions) is not yet ready to accept porcelain as the long-looked-for "perfect filling" with which to fill all classes of cavities, thus excluding other materials which have stood the

test of time for a century or more. It may be possible to use porcelain in this broad manner, and in some cases it may be practical, but is it a logical thing to abandon other methods and materials for the sake of adhering to porcelain as a system?

Dr. Jenkins gives a most lucid description of the insertion of a gold filling, and graphically tells of the unpleasant results following its placement in the tooth, but from the point of view of the practitioner who has not altogether abandoned the use of gold this description seems to be very much exaggerated, and should not pass unchallenged. When an operator has decided that a certain cavity is to receive a gold filling, he sees to it in the preparation of that cavity that frail walls are *not* retained, and that the complete removal of decay is accomplished, and he *does not* depend on fitful and precarious points of attachment, and he *does not*, if he be judicious, "sink" retaining pits in the dentin. Furthermore, he *need not* make a nervous wreck of himself and his patient; and still further, he *does not* so arrange his filling that thermal shock will "announce afresh the rescue of the tooth with every touch of heat or cold," and lastly, if the gold filling by its inharmonious color would "proclaim the past unsoundness of the tooth to every careless glance," the conscientious dentist would not insert it—that is where he would use porcelain, and then it is that he offers up his grateful thanks to Dr. Jenkins and others who have made porcelain fillings and inlays a possibility.

In championing the cause of the gold filling I would not wish to be thought disloyal to porcelain, because I am just as strongly in favor of the use of porcelain in conspicuous places as I am of gold in certain other places. But there are some cavities in sensitive molars and bicuspsids where it would be even more illogical to make the ruthless sacrifice of tooth-structure which would be necessary for the proper insertion of a good porcelain filling, thus causing great discomfort to the patient,

than it would be to trim the cavity to sound margins, line it with cement, and insert a gold filling.

Without entering into a discussion of physics, it would be difficult to deny or affirm the value of a groove in a porcelain filling as an aid in attaching it to the tooth, but I have felt that a close-fitting inlay or filling which is well etched with hydrofluoric acid and carefully set in a perfectly dry cavity has quite as strong an attachment to the tooth as though it had been grooved, and in certain contour fillings such as corners in centrals and laterals, I am sure the fillings are sometimes actually weakened by the use of the illusive groove.

The adjustment of fees for porcelain work seems to be somewhat perplexing, and it will be interesting to note the changes that will naturally take place in the course of time affecting the charges for that class of work. It does not seem right or possible, however, that the fee for work so valuable and so absolutely necessary should always remain at a figure that would make it prohibitory for people of moderate means, and I have no doubt that in time some method of inserting good porcelain fillings will be devised so that they will be within reach of those patients who are not in affluent circumstances.

Dr. F. W. PROSEUS, Rochester. I am very glad to follow Dr. Tracy in this discussion, because it will not be necessary for me to discuss all of Dr. Jenkins' paper, as he has covered the ground so thoroughly that if I were going to write a discussion on this paper I would want to copy Dr. Tracy's notes.

The conditions spoken of by Dr. Jenkins as having prevailed in Germany with regard to the esthetic part of dentistry, we are perhaps entering upon in general practice here. He mentions the fact that in Germany dentists do not put gold into teeth without making a protest. I think today among average dentists that idea is progressing; we find that condition prevailing here with regard to the anterior teeth. But the idea of adopting the radical method of placing

porcelain anywhere in the oral cavity I think is erroneous, and especially so as advice to beginners. While it may be possible with the practitioner who has become perfectly familiar with the subject of porcelain, I think that with the beginner in porcelain work it is a discouragement and a drawback to follow this advice; for the reason that if a young operator expects to fill posterior cavities in molars or bicuspid, he must have experience to put such fillings in, and if he makes a failure much of his ambition and energy is lost, and he has taken about ninety per cent. of his patient's faith out of porcelain work. Now, if he will wait until he has become a master of this work, which can come to him only through the evolution of contact, then I think he would be justified in placing porcelain anywhere in the mouth where his ability would allow him. But in those small cavities in the anterior teeth that we see around the distal surfaces, and perhaps the disto-cervical surfaces, they can be filled with a short operation so as to bring the filling out boldly showing the gold. These fillings are not conspicuous, and the dentist who in the general practice of today insists on putting porcelain in all such places will regret it.

In regard to the fees to be charged for porcelain work, I believe that will work out its own solution. I think that quite a few of our operators in porcelain work are working away from the precious metals, and experience will reduce the time necessary for doing this work one-half, and necessarily also the cost of the operation. When a porcelain filling is inserted the operator has to be sure of his ground; if he knows that filling is going to stay in, then it does not matter so much what his fee is, he is satisfied and the patient is satisfied, but I believe that with the conditions at present it is necessary that we charge a very good fee for this work, because both experienced workers and beginners will have failures, and one has to charge for the extra time, and if you don't you will reap a harvest that is unsatisfactory.

The subject which Dr. Head has taken—the band crown—is very good. He has shown us one that is easy to make and very beautiful, and tells the truth in speaking of the crowns made by porcelain manufacturers being made under pressure as better than those made by hand. I believe they are much stronger than any crown of our own baking. And besides, we have not that experience which only comes from long familiarity with this work; it takes a long time to know what we are really doing in porcelain. Then, again, he speaks of the irritation and infection liable to be induced by these band crowns, probably the greatest source of infection and irritation in crown work. Speaking of gutta-percha as a cementing material for centrals, I believe it is unsightly in many anterior portions of the mouth, as you may have noticed that it gives a very dark gray appearance to the free gum margin.

Speaking of the etching of the inlay, I believe this will not hold successfully the ordinary inlay. Many operators use Harvard cement. That cement is porous, and that one thing should condemn any cement, when we are all so strong in advocating prophylaxis, and we have cements which will hold as well and which are not porous.

Dr. F. T. VAN WOERT, Brooklyn. It is an old and very true saying that only dead men and fools never change their minds; and not being a dead man, and I hope not a fool, I availed myself of this prerogative and changed my mind regarding porcelain. I stated on this floor five or six years ago, in discussing a paper by Dr. Head, that I was very much opposed to the use of porcelain as a filling material. Later on, however, I began to have confidence in it; I felt that it had material advantages that I should avail myself of, and I adopted the high-fusing material. I afterward began experimenting with the low-fusing materials, and especially the Jenkins new product, and from that time to the present in the natural evolution of things I have become thoroughly converted to the use of

Dr. Jenkins' present product. Notwithstanding the good results our good friend Dr. Head gets with his high-fusing material, we have to consider one thing, namely, that he is an expert with that material. Whether the average practitioner could manipulate this material with as much success as Dr. Head is an open question. I have arrived at the time in life when I want the most for as little as possible, as you can imagine, and I think that if I am going to insert a porcelain filling, my chances of success are better with the Jenkins than with the high-fusing bodies.

I would like to go to the end of Dr. Jenkins' paper and begin the discussion there. There is one thing that I could never get through my head from the time I entered the profession, and that is why a distinction is made in fees relative to the cost of the material. In the past, a man would get one, two, or three dollars for an amalgam filling and spend an hour in the insertion of it, and on the other hand he would put in a gold filling in fifteen minutes and charge just as much for it. Now, that is inconsistent. If we are going to sell the goods on a commercial basis and ask nothing for our skill in the preservation of the teeth, that is all right, but if we are to charge for our skill and service in the preparation of the teeth, what does it matter what the material is. Again, we continually treat patients, medicating the teeth, with the adjustment of wedges to force the teeth apart, the getting of a root ready for filling, etc.—take the average day's work, and how much time do you find that you do not get a penny for! Now, our skill is required to restore a tooth to a healthy condition just as it is to restore the masticating and useful conditions of the teeth whether with gold, amalgam, or porcelain. I think the fee for porcelain work should not be a consideration in its adoption by the profession. If a member of this profession can make a better and more lasting operation by restoring the teeth by porcelain it is his duty to do it, and he should see that he is properly reimbursed for the skill exercised.

As for the advantage of gold over porcelain in reference to the cutting away of tooth-structure, I can see no comparison. If there be any one material that will prevent the sacrifice of tooth-structure it is porcelain; I remember a gentleman spoke of that once as one of the reasons why gold was better. Take for instance a large disto-approximal cavity in the first molar running under the coronal surface; if we are going to prepare this for gold we must cut away the thin walls of the side to prevent shelling. It makes no difference what preparation of gold be used for the filling, if you have not strength something is going to give, and those weak walls will give, because of the continual pounding upon the gold against this structure, and in time it spreads away from the point of contact and brings pressure upon these walls. On the other hand, why is it better to use porcelain under such circumstances? We all know what cement will do on weak walls when properly protected. If a porcelain filling be properly made—and it is supposed to be thus made or not at all; this qualifying of every operation with "if properly done" we should not recognize as worthy of consideration; a porcelain filling that is not properly made should not be inserted. We all have failures, and when we make a failure of an inlay it should not be inserted. How many men in this room can say that they have not had failures with any kind of fillings? We are not going to condemn porcelain because we make failures, for you have had failures with every conceivable material used in operative dentistry. But I make the assertion that the percentage of failures with porcelain is less than with anything else. But when a man talks of not making failures with any material—the men who have had experience in this work know that it is a mistake to talk in that way to the young men of the profession. The young men are the coming men, and they are the ones we are to look to to see porcelain established as the ideal filling material.

Now as to the question of time. If I

cannot make a filling of porcelain and do as well as with gold in a great deal shorter time, then I will never speak again. Do not misunderstand me; I am not decrying the use of gold, nor advocating the use of porcelain to the exclusion of everything else. But I do say that the possibilities of porcelain, from the results I have seen thus far, exceed those of anything else. With porcelain of the present day—as it comes from Dr. Jenkins today—there is a possibility of a perfect filling. I believe that it takes much less time to make a porcelain than a gold filling. I believe that the use of gold in the anterior teeth in particular is going to be a thing of the past, and it is only a question of a little time when we will be using porcelain all over the mouth. I am, in fact, so using it.

I have a number of teeth prepared showing how, by the adoption of a method I use—I cannot recall the name of the man who originated it, but he is from Germany—large contours are restored in the back of the mouth where we could not place any of the ordinary materials without wedging. This gentleman recommends the use of No. 33 or 34 gold plate, burnishing it into the cavity as with any matrix, and baking the porcelain into that, being careful not to carry it beyond the edges of the matrix, and making undercuts in the gold matrix, and putting the whole thing in place, cemented, after which it can be beautifully finished. I have several of these fillings, which are easier to make than the ordinary inlay and easier by far to make than a gold filling, and I believe their lasting qualities are excellent in every respect.

I want to speak of Dr. Head's crown. I believe that it was before the New York Society a great many years ago that I talked upon the question of crowns in a controversy between Dr. Ottolengui and myself, and the question of root-formation was one of the strong points that I made in opposition to the Logan crown at that time; and the principle which Dr. Head has shown is almost identical with that which I described at

that time, with the exception possibly of the root being curved rather than straight. This procedure I have followed all these years, and when I put on a Logan crown the root is prepared that way and a piece of No. 34 gage gold is burnished over the root, and the pin is pushed through and the crown adjusted, and this is filled in with Jenkins' body. The gold is left there and the crown is cemented to place. I can show you where crowns of nearly every description would not be tolerated, but where these crowns have been very successful. I have one case of this kind where nearly five years ago a crown of this character was put in, and I do not think you can find today a healthier crown in any mouth than that one.

Dr. J. W. BEACH, Buffalo. I have very limited knowledge of the high-fusing bodies. I have used them, however, in a too limited degree, but I am very much in accord with some of the sentiments expressed by Dr. Van Woert in regard to the Jenkins' material. It is claimed by some that there is not sufficient strength in this material, but up to date I have found that it meets every requirement in my work. It may be claimed for Dr. Jenkins' material that the natural colors of the tooth are easier to produce than with the high-fusing materials. I believe all porcelain-workers concede this. By a combination of the different colors before they are baked, according to Dr. Reeves' system, we get a more natural tooth-color. Of course there is little translucency, and it does not refract the light as the natural enamel does; however, we get better results from it than with the high-fusing bodies.

As regards the time of preparing the cavities, baking and placing the porcelain, as compared with gold, I believe that we will eventually find it to be in favor of porcelain. In my office I have an assistant who is expert in the manipulation and baking of the bodies, and after the matrix is prepared it is turned over to him. He looks at the case in the mouth, selects the shade, and builds the

body up to the required contour while I proceed with another operation, and by the time the porcelain is baked and ready for the mouth another matrix is ready for the assistant, and in this way I can carry the work along very rapidly. And by such means I think we can not only save our time, which is more valuable than an assistant's, but at the same time we can reduce the fee proportionately to our clients. However, I do not think that a reduction in the fee is really called for even in these cases, but I simply mention this as it may help to solve that phase of the question.

Dr. HEAD (closing the discussion). Porcelain fillings come under the head of artistic work, and with artistic work some efforts must be more successful than others; still I am much gratified with the words of praise that have just been offered, and will do my best to always merit them. There is no doubt that poorly matched porcelain fillings look better than gold. Sometimes they come to our notice so well made that we do not see them at once, but usually we are not troubled that way.

Concerning Dr. Tracy's remarks on etching with hydrofluoric acid, I do not personally care for the etching method, although many good operators do, and for that reason I would suggest the use of white acid for anyone who cares to use the etching method. It is an acid used by glassworkers and is used for making a frosted surface on the glass. It is prepared by the saturation of ordinary hydrofluoric acid with ammonium carbonate. The saturated solution should be evaporated to one-half and then refilled to the original bulk with hydrofluoric acid and once more evaporated to one-half its bulk. This acid will give a surface which is more tenacious in its adhesion to cement than the ordinary hydrofluoric acid etching.

Just a word or two concerning fees. I feel that if we were to charge ten and fifteen dollars for all porcelain fillings, ignoring the paying power of the patient, as some have suggested, it would end by the patients' ignoring us. We

have to be guided by our patients' ability to pay. I think we have very few patients come to us, perhaps outside of New York, who can pay ten and fifteen dollars for each filling when they may each have fifteen to twenty-five fillings to be put in. The children for whom we work may not care, but the head of the house will. However, I feel that the advance in porcelain inlays and in the methods of inserting them is becoming so rapid and so much improved, that the time is not far distant when the ordinary operator will be able to put in one or two an hour, and that will of course bring down the fee to a normal price. I quite agree with everything Dr. Van Woert says when he claims that the ordinary porcelain filling is put in more efficiently and more rapidly than the ordinary gold filling.

The speaker who spoke of the non-advisability of putting porcelain in the approximate spaces of bicusps but who preferred to make approximal fillings of gold where they do not show much spoke in opposition to everything that I believe. I should rather have a gold filling in plain view so that everyone would know what it was, than to have a gold filling between the approximal surfaces look like decay. A gold filling which casts a shadow in the teeth is of all things, I think, the most unwholesome-looking. Those teeth look dirty.

Concerning non-porous cements, I am aware that if we took the advice and statistics of the manufacturers there are at least fifty or a hundred non-porous cements on the market. I think that Archite was supposed to be non-porous. I have heard that Petroid was non-porous; if we don't get the filling in like lightning this cement will set so quickly that when the filling goes to place you will have a bad joint no matter how well the inlay has been made. I like a cement that sets slowly, and while I have used Dr. Ames' cements and had good results, I can only say that the Harvard cement for the last ten years has given excellent results in my hands. Fillings stay in the teeth and show no signs of decay, the

mouths look healthy and clean, and it seems that if any bacteria get in the joint they are like an army without its commissary—they can do no harm. Again, Harvard cement seems to have another advantage in that it has a little expansion at the moment of setting—just a little final squeeze that I think helps to hold the inlay into place.

Concerning Dr. Van Woert's change of mind, I have great admiration for a man who has been of one mind and can change. I have done this myself very often, and I hope that Dr. Van Woert will do so again when the time comes, and I have hopes that he will change his mind with regard to his belief that the low-fusing bodies are better than the high-fusing. Concerning the statement that the low-fusing bodies have a better color than the high-fusing, and that their non-translucency excels that of the high-fusing, I do not agree. In fact, that was just the thing in which I claimed the superiority of the high-fusing body over the low-fusing body. All porcelains are dependent on careful baking. If we have the inlay in the furnace a few seconds too long the porcelain ceases to be porcelain and becomes glass. Many times when we take a labial inlay out of the mold and put it in the tooth it looks very pretty, and we say, "Oh my! I don't see how I can do such good work." But after we cement it in we find that it looks like a hole in the tooth. We see the color of the cement underneath the inlay and do not see the tooth-color at all. I had rather have a slight granulation of the surface and have to polish it than to have too great a gloss; but of course I should prefer to have the inlay baked accurately.

A MEMBER. Doctor, will you tell us what-porcelain you use.

DR. HEAD. I am using the Whiteley high-fusing body and the high-fusing bodies of the S. S. White Co. There are some colors in the S. S. White bodies that I cannot get anywhere else, but I have found that the chief disadvantage of the ordinary porcelain body as made by the S. S. White Co. is that it is ground too

fine. Fine material is beautiful for carving, but in inlay work there is such a contraction of the material that four or five bakings are necessary for each inlay, and this will frequently result in over-baking. For that reason Dr. Gilbert of the S. S. White Co. has made some material of a little coarser grit, and I find that this gives just as good a finish, and makes it possible to finish an inlay in two or three fusings.

On motion the subject was passed, and the meeting adjourned until 2 o'clock.

FIRST DAY—Afternoon Session.

The afternoon session was called to order promptly at 2 o'clock by the President.

The first order of business was the report of the Executive Council.

The report was accepted as read.

Dr. B. HOLLY SMITH, Baltimore, Md., then read a paper on "Gold in Dentistry." (Printed in full at page 529 of the July issue of the COSMOS.)

Discussion.

Dr. R. M. SANGER, East Orange, N. J. Dr. Smith has very truly said that gold is—I think it must always be—the dentist's mainstay. In the paper he says, "Is gold still important as a filling material?" I do not think he asks the question doubtfully, but rather because he had the feeling that in this day of new methods and new materials the younger generation of dentists were being led aside and coaxed away from a good old friend, and perhaps would some day wake up to find that they had pinned their faith to the wrong material and had many failures to their credit because they had not first learned well the use of their true sheet anchor. Now, he has gone into the different preparations of gold, and his position with reference to gold reminds me of the anecdote of the Irishman who, when somebody spoke of bad whiskey, said, "No, there is no such thing as bad whiskey."

Some kinds are better than others, but none are bad." So with Dr. Smith, when he speaks of the different preparations of gold, giving their advantages and disadvantages, he does not condemn the use of any.

I want to say just a word, however, in the way of caution along a line on which he has not spoken except in a general way. From time to time we have had introduced to the profession various forms of sponge golds. They have been offered in the majority of cases as short cuts, and Dr. Smith has demonstrated in his paper that there is no such thing as a short cut in the use of gold. These sponge varieties of gold are a snare and a delusion, I think. The anchorage of a disto-approximal filling may be hard to reach, and so the young practitioner is tempted to take a large piece of sponge gold and pass it up between the teeth into the retaining groove and there attempt to condense it, working it down until it is comparatively tight and held to place. Then he expects to build on to that with a rocking motion, using large pieces, and as he gets down to where the filling is exposed he takes his mallet and attempts to condense the gold properly. What is the result? and why is it that these fillings fail? The actual result produced is this: The surface of his first piece of gold is condensed, but the lower stratum of gold is not condensed as it should be. He has simply built his faith on something that will fail. Dr. Smith has illustrated that by calling attention to the fact that when a piece of gold is once put to place it must be held there and must be condensed, and that the greatest condensation must be upon the retaining pieces, or at the beginning of the filling. And so I want to emphasize that point, and warn the younger men against falling into the belief that because a piece of sponge gold will stay in place it has actually sealed the cavity and made it tight.

I would also like to take the time to add just a word to what Dr. Smith has said in regard to annealing. I believe that the introduction of the electric an-

nealer is a decided step in advance, and that with it gold can be brought to the proper condition with less handling, and that it is a most uniform process.

Dr. JOSEPH HEAD, Philadelphia. I suppose that I am asked to speak on this subject because my paper might give the impression that I am not in favor of the use of gold. I am in favor of gold. I like both soft and cohesive gold in their places. Dr. Smith seems to feel that this question of filling teeth with gold is modern, and dates only from the eighteenth century. My friend Dr. Kirk a short time ago gave me a little extract from a book that was printed in the fifteenth century, in which the author quoted from a physician of the seventh century, giving as perfect a description of the methods of modern gold filling as anyone could wish. It was correct from the beginning to the end, and I think if that gentleman could have been here today, and had heard Dr. Smith's dissertation on filling teeth with gold, he would have simply clapped his hands and said in Arabic, "Brair!"

Concerning the question of non-cohesive and cohesive golds, Dr. Smith has gone into the question of external agents being applied to the surfaces of the gold to make it non-cohesive. Abbey's gold has been found on analysis to contain iron. This iron may be an agent applied externally in liquid form. Dr. Black seems to think that the non-cohesiveness of sheet gold maybe derived from contact with ammonia or chlorin which collects upon the outside of the sheet; in fact, he believes that this gas, when incorporated within the body of the gold, may to a certain extent account for the fact that non-cohesive gold preserves the teeth better than cohesive gold. Whether that is so or not is a question for speculation.

In speaking of a gold filling being water-tight, I am sure Dr. Smith did not mean that. We cannot put a water-tight plug into a sponge. The teeth are saturated with moisture, and I think he meant to say a bacteria-tight filling; and that brings me to the question of sponge golds as mentioned by Dr. Sanger. The

great disadvantage of the ordinary gold filling lies in the fact that it is non-adhesive, and I do not think that there is a man among us, even the most successful, who when he has put in an ordinary non-adhesive gold filling can hold up his hand and say, "I am sure this filling will not leak anywhere." In fact I think we are justified in believing that the so-called area of decay, so much dwelt upon by those who advocate extension for prevention, is largely due to the fact that there are little crevices and leaks on the approximal surfaces of a gold filling, and that they decay more readily because these places are more frequently bathed in bacteria, more readily infected, and more readily broken down. In further proof of this fact, it is noticeable that when porcelain inlays are used on approximal surfaces of the teeth this so-called area of decay does not seem to be apparent. I am sure that any man who has given much attention to inlay work will notice plenty of places between the teeth successfully guarded by inlays that otherwise would have to be cut freely in order to get good results with gold.

This so-called *bête noire*, sponge gold, with its tendency to leaky edges, can now be made very safe and valuable in dentistry. If when we have a large coronal cavity we take a little creamy mix of zinc oxyphosphate and line the cavity, then pack a thin layer of sponge gold over this and allow the cement to set, and then pack the gold up to the coronal edges, being certain that the edges are perfect, we will have the ideal gold filling. One has then found where the sponge gold has a legitimate place in dentistry, and having an adhesive gold filling, one has in my opinion the most perfect gold filling that has ever been given to the dentist to make.

Dr. B. S. HERT, Rochester. There is very little that I can add to what has already been said, but I want to say that I have never heard or read a paper on the subject of gold that I enjoyed more, or

which covered the subject more thoroughly, than Dr. Smith's. Like the essayist, I feel that gold is the most useful substance that we have for filling teeth at present. There have come to us from time to time various filling materials to supersede gold, but so far none has been found to take its place. There is one point I should like to mention, and that is in regard to condensing the filling. It is not necessary to make it all perfectly solid from start to finish, but if it be fairly well condensed from the cervical wall to near the occlusal surface, and the last few layers are of gold carefully packed and perfectly condensed, the filling has sufficient strength to withstand the necessary strain to which it will be subjected.

For finishing the surfaces, Dr. Smith speaks of using thick or heavy gold. The advantage in this is that having less surface to weld together, it is easier to get a smooth and uniform finish, and it is less liable later on to become pitted.

Dr SMITH (closing the discussion.) I have very little to say in addition to what I have said in the paper. I should perhaps say, as an excuse for offering this paper, that it was the result of a statement made by one of the most skilful and successful users of porcelain that the days when gold fillings were to be noticed in the human mouth were numbered; that, with the great American advancement in dentistry, gold was to be a thing of the past; that porcelain would supplant and take the place of the filling of teeth with gold. That statement was the origin of the paper.

The discussion of the paper has been very satisfactory to me, and I only want to say in addition that I would appeal to my professional brethren to study the poetry, the music, the rhythm, the beautiful qualities of gold all the time. I would have them appreciate its idiosyncrasies and excellences, and learn to use it in all its forms.

(To be continued.)

CONNECTICUT STATE DENTAL ASSOCIATION.

Fortieth Annual Session.

(Continued from page 670.)

ON motion Dr. Gerrish's paper was passed, and the association listened to a paper by Dr. EUGENE H. SMITH, Boston, Mass., entitled "Preliminary Requirements to Dental Education." After the discussion that ensued the meeting adjourned.

TUESDAY.—*Evening Session.*

The President called the meeting to order at 8 o'clock.

Dr. S. H. GUILFORD, Philadelphia, Pa., read a paper entitled "The Obligation of the Profession to the Colleges." After its discussion,

MR. F. LEROY SATTERLEE, JR., A.M., New York, read a paper entitled "Recent Applications of the Tri-Ultra-Violet or X Rays to Dental Surgery. (Printed in full in the August issue of the COSMOS, at page 639.)

After the reading of the paper,

Dr. F. D. WEISSE, New York, made the following remarks on the same subject:

ON THE X RAY IN DENTISTRY.

The work that has been presented here tonight by Mr. F. LeRoy Satterlee, Jr., shows the progress made in the laboratory of the New York College of Dentistry, within the last two years, in developing the possibilities of the X ray in dentistry.

Some two years ago (December 1902) I attended a meeting in Chicago of the Institute of Dental Pedagogics, at which Dr. Weston A. Price read a paper on

and presented illustrations of X-ray work in its diagnostic advantages in dental and oral surgery. I was struck with the illustrations and their unquestionable advantages to the practicing dental surgeon. I therefore thought that it was the duty of dental educational institutions to develop this work for the more thorough education of the dental student, by adding to the subjective and objective symptoms of dental and oral pathological conditions the objective conditions afforded by X-ray photographs of the teeth and maxillæ.

The New York College of Dentistry upon my suggestion immediately commenced fitting up an X-ray laboratory, and during the rest of the winter of 1902-03 we made some progress. We have since perfected our equipment, and now instruction in X-ray work is established as a part of the education of the student. The laboratory has been under the direction of Mr. F. LeRoy Satterlee, Jr., A.M., assisted by an expert photographer, and weekly classes, of three students in a section, take X-ray pictures of infirm cases and do practice work in the mouths of their fellow students. I have followed with much interest the development of the work, and both Mr. Satterlee and myself have gone through an education as to what the X ray will do. All patients of my oral surgery clinic and doubtful conditions in infirm patients go to the X-ray laboratory for X-ray photographing of their buccal conditions. All these illustrations contribute to our collection for the education of students.

I prophesy that in the near future when a patient comes under the care of a dental practitioner he will require a series of X-ray photographs to be taken of the upper and lower dental arches of the patient, from which positive knowledge of the normal and abnormal conditions of the teeth and alveolar processes may be obtained. These photographs will indicate the immediate treatment required, and in the subsequent care of the patient they will serve for constant guidance as to the care of the teeth. The time will come when X-ray work will be done in completely appointed dental offices, and the practical application of this work to everyday practice will result in the prevention of the development of pathological conditions, by their early recognition and treatment, thereby protecting humanity from what it has suffered in the past.

Dr. Weisse then recalled several of the lantern slides shown by Mr. Satterlee, and explained the different points of advantage to the dental surgeon in the recognition of pathological conditions of the teeth, the alveolar processes, and the upper and lower maxillary sub-regions of the face.

A motion to adjourn was made and carried.

WEDNESDAY—*Morning Session.*

The meeting was called to order at 10 o'clock by the President.

Dr. R. M. CHASE, Bethel, Vt., read the following paper:

MAKING PORCELAIN INLAYS BY THE IMPRESSION AND MATRIX SYSTEM.

Making porcelain inlays by the impression and matrix system is the result of a method devised several years ago for making gold fillings out of the mouth in a matrix or mold, either by packing gold directly into the matrix and melting away the metal, or by burnishing platinum foil into the matrix and melting scrap gold into the foil, thus forming a

gold filling, and cementing the same into the tooth-cavity.

As this method or system was published in several dental journals in 1900, I need not go into details of gold inlay work. Suffice it to say that the materials I used seven or eight years ago were crude and imperfect. The principle, however, was correct, and gave me an incentive to work out and overcome the difficulties incident to an undeveloped system. Porcelain as a filling material should be and is being utilized more and more every year, but only the expert operators have been able to produce this class of work satisfactorily. There is no reason why the average practitioner should not become proficient in this line of work, provided a system is taught that will produce positive and artistic results.

It is needless for me to go into details of cavity preparation for porcelain inlays. This part of the operation has been so thoroughly explained in our dental journals in the past few years that I assume you all are familiar with this important step. Starting, then, with a properly shaped cavity, we proceed to secure a reproduction, or impression, of the same. We divide cavities into the following two general classes:

The first is that of the labial, buccal, and crown variety. Impressions of this class of cavities are to be taken with a special impression compound which after much experimenting and repeated changing of formulas I have found best adapted to the purpose. This compound copies and retains perfectly the most delicate lines and shape of the tooth-cavity, so essential to the perfect results of this system. As this compound absorbs water readily, it should not be allowed to come in contact with moisture unnecessarily.

The second class includes all the cavities found in the approximal surfaces, and should be taken with my special cement prepared especially for approximal cavities. This cement differs from all other cements, as the mix is made with water, which is readily evaporated, leaving a perfect reproduction of the cavity,

and upon the reproduction, after drying, may be poured molten matrix metal without changing its form. This in itself is quite an advance step, as these cavities were extremely difficult and often impossible to reproduce with my regular impression compound or with any other material.

For cavities of the first class take a piece of the compound half the size of an English walnut, working and kneading it with the fingers and tempering it so that it will be a little stiff. If too soft, either roll in a napkin to absorb the excess of glycerin, or work into the compound a little powdered pumice. If too hard, work into the mass a drop or two of glycerin. One or two trials will enable one to temper it just right. Place the compound in a crown impression tray, and work the center of the mass to a point or convex surface; dip the finger into the talcum compound, and rub the surface until it presents a shiny appearance.

With the cavity, tooth, and gum perfectly dry, place that convex point in the cavity, and with a firm and steady hand press the compound into place. This will give a perfect impression of the cavity as well as the surrounding parts, the latter giving ample surface to enable the adjustment of a band of very thin metal without disturbing the cavity impression. The band should be as large as the surface of the impression will allow. Carefully adjust the metal ring or band into the compound around the cavity impression. See that the edge of the band sinks into the compound to prevent the molten metal from escaping underneath.

To produce a metal suitable for making matrices or cavity reproductions has been one of the most difficult problems in connection with this system, for indeed it must possess certain characteristics not found in the ordinary fusible metals which have been heretofore produced. A metal suitable for this work must be readily fusible, yet exceedingly hard, to withstand considerable pressure without change of shape while fitting the foil matrix. It must cast sharp to reproduce

perfectly the angles and edges of the cavity; it must neither shrink nor expand.

Heat two or three bars of the matrix metal in a spoon or ladle to a degree that will just char or brown white paper. When this is accomplished, pour into the band on to the impression. As soon as the metal is cool, separate, and a perfect facsimile of the cavity will result.

The second class, or approximal cavities, requires a different impression material. Having secured ample space, which should be wider than the depth of the cavity, with dam adjusted, mix a little of the special cement with a drop or two of water to the consistence of thick cream, fill the cavity, permitting the cement to overlap the edge of the cavity; in a few minutes the cement will be hard. The cavity having been previously wiped with vaselin or oil, it can be easily removed and should be placed upon a flat piece of compound with the convex surface uppermost. Around this place a metal band, and after heating the filling to expel any moisture, pour the metal into the band.

The cement enables the operator to get an impression of difficult cavities which would be impossible to produce with the impression compound. The cement impression should be thoroughly dried out to prevent any escape of steam, which would spoil the matrix, either by holding over a flame or by setting aside until all the water has evaporated. Do not be in haste to remove the cement impression from the cavity, as the longer it remains the harder will be the impression and the less liability to fracture when removed. It takes about fifteen or twenty minutes for the cement to harden in the cavity.

Having secured an impression and matrix, the balance of the operation is simple and easy. Cut a piece of 1/1000 or 1/2000 platinum foil of sufficient size to enable its being held steadily upon the matrix with the left thumb and index finger during the shaping, which may be done in the usual way by the use of spunk, burnishers, etc.

The foundation of a good inlay is a good impression of the cavity in the form of a matrix. Many failures are due to a poor matrix. It will readily be seen that with my matrix-former it is practically impossible to get a poor matrix owing to the even distribution of the force applied to the foil and the stretching and swaging of the metal from the center.

With my device, matrices are so easily, quickly, and accurately made that in my practice I generally make several so that I can bake several inlays of slightly varying colors at the same time.

Discussion.

Dr. F. L. FOSSUME, New York. I am very sorry that I did not hear Dr. Chase's description of this new metal. I have not been successful with the impression system and the swaging of matrices for inlays. My greatest difficulty has been in approximal cavities. These are the ones which we are called upon most often to fill, and to withdraw the impression without spoiling it is next to impossible. In cervical cavities this difficulty is not encountered, but in swaging or burnishing, the edges of the cast often become rounded and the finished inlay will have a feather edge. I have used cement and stearinized plaster dies, but it is possible that Dr. Chase's metal is hard enough to preserve a perfect edge. Feather edges on inlays break off, and a dark rim will appear around the filling, even when it otherwise fits well.

I prepare simple cavities with flat floor and straight walls. The gingival wall had better be cut at right angles to the floor, and the others at slightly obtuse angles. The orifice will then be slightly larger than the floor, and when the inlay is cemented in place the adaptation at the cervical margin will be the best possible, as the slant of the walls will drive it against this point. The finished inlay will be of uniform thickness, and block-shaped. This form gives resistance to stress, and the filling will not slide or rock in the cavity, and when

roughened and cemented it will stay there.

With reference to the cements best suited for inlay work, they should attain maximum hardness and adhesiveness when mixed to a thin consistence. The cement should also mix smooth and creamy to facilitate flow and occupy less space; and it should also set quickly.

Considerable force is required to drive the inlay into place when cemented. I use an instrument made of ivory for this purpose. There is no danger of breaking the inlay if it has the cube form. I believe porcelain inlays constructed in this way will preserve some teeth better than any other filling, and esthetically it is far superior in any place in the mouth within the line of vision.

Dr. E. S. GAYLORD, New Haven. I desire to call attention to the article in the March number of the *Western Dental Journal*, by Dr. C. C. Allen of Kansas City, in which he describes a new and original method of making matrices for inlays by the use of gum camphor as a means of swaging the matrix in the cavity. I have employed the method, and have no hesitation in saying that by the use of it perfect adaptation and margins can in all cases be obtained. I am pleased to indorse Dr. Chase's method as a means of producing good results where one wishes to work from impressions, which many times is a relief both to patient and operator.

Dr. CHASE (closing the discussion). While Dr. Gaylord is doing all this, I have the impression; and when you have the impression it takes only a minute to make the matrix, and then you can make as many inlays as you like. With his method you have to go through the same process in order to get a new matrix every time. I think that an impression that will give you a perfect mold of the cavity and one that you can keep if you like is preferable. You can make several inlays from the matrix, and with one who has not done so very much porcelain work this is an advantage, because we cannot

always get the proper color at the first attempt.

Dr. Chase's paper was passed, and Dr. A. J. FLANAGAN, Springfield, Mass., gave a talk on the "Samsioe System of Crown and Bridge Work," as follows:

SAMSIOE CROWN AND BRIDGE WORK.

One year ago I promised the president of this society that I would do something at this meeting in the way of a clinic, and I was very much surprised when I found that I was down for an essay. I have no essay to offer, but will in a few minutes describe to you the Samsioe system of crown and bridge work. Some years ago a young man by the name of Samsioe attended the Harvard school. It happened that some years before his matriculation he had practiced dentistry in Sweden, and the financial condition of many of his patients was such that they could not afford to spend the money for the more expensive materials necessary for crown and bridge work, so he decided to try and work out a system of bridge work on a very cheap plan with the hope that poor people and dentists in general could have the benefit of this work. He invented a metal, an impression compound, and a soldering acid with which he could take an old rubber tooth and make a very presentable crown.

The whole outfit is bought for the sum of \$2.25, and being interested in charitable work and an attendant at various charitable institutions, the thought struck me that there were many patients that could be helped by this method who were not able to spend the money for gold work. All of us have a lot of old teeth lying around the office, and if you take this system you can utilize these old teeth, and make a very presentable crown on a very cheap plan, one that is very practical. So far as I can judge, the crown made by this system will compare favorably with many crowns of greater expense.

In using this method you can take German silver or platinoid for the post. Prepare the root in the general way, fit

the post, attach the tooth to the post with softened impression compound, and then press the crown home on the end of the root. See that the facing is in the proper position as regards the bite, and after allowing the compound to cool slightly, gently remove the crown and post—now attached together—from the root. Carve the impression material to the form you wish your finished crown to have. Make a plain investment, remove the impression compound and flow in your metal, and you have a very presentable crown. This metal melts at a fairly high degree, and it is a kind of fusible metal. Melotte's metal can be used in place of it, but it will not take as sharp an outline and is not as strong. After some five years of use I have cases in which there is no breaking away of the metal or porcelain part.

One of the greatest uses of this system is in fractured Logan crowns; and we all have them occasionally in such a condition. The pin is usually in position and cannot readily be removed from the root. What are you going to do with these—are you going to spend two or three hours getting the pin out? I have done this, but now when a case of this kind comes to me I don't worry about it at all. I simply go to work and use the Samsioe system with a plate or rubber tooth for facing. With the pin extending from the root, take the tooth with the softened impression material attached and on the end of the root, placing the facing in proper position, and allow this to cool. Take the whole off, invest, remove the impression material, and then pour your metal. This is attached by cement or gutta-percha, preferably the latter.

The greatest use of this system consists in its adaptation to charity work. It is not a showy piece of work. The metal, of course, shows on the palatal or lingual portion of the crown or bridge, and in some cases it will darken a little. The method is so simple and cheap that I am surprised that more dentists have not become acquainted with its advantages. I think I shall be able, in my clinic this

afternoon [see opposite page], to demonstrate a few points of interest in connection with this system.

Discussion.

Dr. G. L. WILCOX, New York. I will demonstrate in my clinic this afternoon the unfitness of platinoid for use as pins in the roots of teeth. I think it is the most detrimental of all metals we can use for making crowns and connecting bridge work.

Dr. D. GENESE, Baltimore. The essayist has mentioned fusible metal melting at a fairly high temperature. It is a very useful article to have around, and any of the fusible alloys can be largely improved by simply dropping a little pure silver in them. The softer metal seems to have the property of preventing expansion in the harder one, and these alloys will fuse at a lower temperature.

Dr. FLANAGAN. I will take pleasure in antagonizing Dr. Wilcox on this subject. I would like to ask Dr. Wilcox what he uses to set his crowns with.

Dr. WILCOX. In permanent work I never use anything but cement. In temporary work gutta-percha will work very nicely. I have seen Logan crowns after being set for nine years, and to all appearance solid, with just a piece of cotton around the pin, and that crown retained for nine years, showing how little it takes to hold a crown in place. In permanent work, however, I do not depend on anything but cement.

Dr. FLANAGAN (closing the discussion). I do not pretend to be a scientific man, but one of the greatest troubles in society meetings comes from gentlemen getting up and condemning a thing simply because of a want of common chemical knowledge. Any man who will investigate the cement question will come to the conclusion that there is no cement but what is composed principally of glacial phosphoric acid and zinc oxid. Now, if you mix phosphoric acid with zinc you have a chemical compound. You have the action of a metal on an acid. There is hardly a man but knows that

the best metal to use for non-corrosive qualities is pure platinum. Therefore, if you use pure platinum, no matter what the chemical composition of your attachment is, you have a metal which will not be attacked by chemical action. You will find that the greatest trouble in crown and bridge work today comes from the medium of attachment of the crown and bridge. I find that where platinoid or base metals have been used, and you have a film or a solution of gutta-percha surrounding the pin, you have the best medium of attachment you can get. After using gutta-percha for six or seven years, I have never yet seen the corrosive qualities of any ordinary metal brought out to any extent, and why? It is simply a question of common chemistry.

This cannot be said where cement has been used. The first days of laying submarine cables brought forth the benefit of having a gutta-percha film or covering surrounding the center or core of the cable, and to this day a like covering is used. Could any greater evidence of the non-corrosive quality of gutta-percha be asked? Dr. Wilcox, I think, will find that it is not the material but the man at fault this time.

Dr. FONES, chairman of the Nominating Committee, then announced the following nominations for officers of the association:

President—D. W. Johnston, New Haven.

Treasurer—E. B. Griffith, Bridgeport.

Secretary—F. Hindsley, Bridgeport.

Assistant Secretary—C. C. Prentiss, Hartford.

Dr. JAS. McMANUS moved that the report be accepted and that the secretary *pro tem.* be empowered to cast one vote for the entire list of nominations. Motion carried.

Drs. Loomis and Strang were appointed a committee to conduct the new president to the chair.

Dr. A. C. FONES, chairman of the Committee on Necrology, then presented the following report:

We the members of the Connecticut State Dental Association greatly regret to hear of the death of our fellow member Dr. George C. Eighme of Bridgeport, and desire to convey to his family our sympathy and condolence in their bereavement.

Dr. GAYLORD moved that the report be received and spread on the minutes of the association, and that a copy be sent to Dr. Eighme's family.

The motion was carried.

On motion, the thanks of the society were extended to all who participated in the meeting, and to the DENTAL COSMOS for their kindness in publishing the last year's report in pamphlet form.

Dr. McLEAN, in presenting the gavel to the new president, expressed his thanks to the members for their hearty co-operation in promoting the meeting commemorative of the fortieth anniversary of the association, and wished for the new president the same hearty support that he himself had received.

Dr. JOHNSTON, in accepting the gavel, thanked the association for the high honor conferred upon him, and assured them of his earnest efforts for a large and successful meeting next year.

There being no other business before the society,

The PRESIDENT declared the meeting adjourned until the next annual session.

CLINICS.

Dr. ANDREW J. FLANAGAN, Springfield, Mass. "Samsioe Crown and Bridge Work." The outfit consists of three materials not usually found in the average dental office: Regina compound, Rex alloy, and Rex soldering fluid. These can be purchased of The S. S. White Dental Mfg. Co. for the sum of \$2.25.

Suppose you wish to make a crown similar to a back and solder crown. Prepare your root in the usual way, also post to go into. See if the bite be "close" or otherwise. If "close," take a cross-pin plate tooth and grind a slot in the palatal

side of the porcelain from the gum aspect of the tooth to just below the pins. This slot will pass through the space in the porcelain between the pins of the tooth. Take the post and flatten the blunt end so that it will pass through the space between the pins of the porcelain tooth. Roughen or barb this part of the post and also the pins of the tooth. Bend the pins across the post, thus holding the latter tightly to the tooth. Take Regina compound and soften slightly, then mold over the back of the tooth, around pins and post, enough of the compound to represent the amount of backing necessary to contour the tooth. The root being wet, pass the pin into it and you have an accurate impression of the end of the root attached to your crown.

After slightly cooling and being sure the impression of the end of the root is correct, try it again, and trim the palatal part of the compound so as not to interfere with the bite. Remove from the tooth and invest in plaster, or sand and plaster, leaving just a small part of the palatal aspect of the compound exposed. Where the investment is hard, warm the compound slightly and pick it from around the pins and the back of the tooth. Thoroughly coat all metal parts with soldering fluid, and lay in the hole enough cubes of Rex alloy to about make the contour of the backing. Put over a Bunsen burner and heat until the cubes of alloy soften and drop into place. Remove from the burner, and as the metal is about to congeal take cotton on the end of pliers and press thoroughly home, thus causing the softened alloy to fill every crevice. When cold remove from investment and trim and polish in the usual manner. You can set the crown with cement or gutta-percha, but preferably the latter.

Logan crowns occasionally break, and usually the pin is securely fastened in the root. Leave that pin in the root and remove all porcelain from the end of the pin; and cement also for a short distance around the pin where imbedded at about the gum line. This will make a kind of

ring or groove in the cement around the end of the pin exposed. Select a cross-pin flat-back tooth suitable to match the conditions, and bend the pins in the manner you would if you were to use it in a rubber set of teeth. Try on the tooth to be repaired, and you will find the end of the Logan pin goes between the bent pins of the plate tooth. Remove and mold the Regina compound as in the preceding case. Invest and attach the Rex alloy as in the preceding case. Trim and polish as in the preceding case. If the hole for the Logan pin is not accurate, take a bur and cut out some of the Rex alloy to accommodate the pin. Set with cement or gutta-percha.

There are many practical and very useful ways of employing this outfit in the making of crowns and bridges, and I would refer you to a book published by The S. S. White Dental Mfg. Co., entitled "Plateless Dentures," by Dr. Samsoe of Sweden.

Dr. J. H. LYKE, New York, N. Y. "The Jackson System of Regulating." Dr. Lyke demonstrated the Jackson system of correcting irregularities of teeth. He showed the method of constructing appliances, first describing how to prepare a model. An accurate model is made and the teeth carved slightly at the neck, which causes the appliance when made to fit more closely, insuring good anchorage. The different parts were prepared and held in place on the model for soldering with pins and moldine. He described the different kinds of base-wire, and made apparatus including each form; attached springs of different shapes to the base-wire, both for pushing the teeth outward and moving them inward. Models and appliances of numerous cases were presented, illustrating the expansion of the arch; moving incisors outward; moving them inward; moving canines outward and inward, etc.

Dr. ALFRED C. FONES, Bridgeport, Conn. "Amalgam *versus* Gold Crowns." The object of Dr. Fones' clinic was to emphasize the importance of a flush joint

in the restoration of broken-down molars and bicusps in order to maintain a condition of health of the peridental membrane. He claimed that not one gold crown in fifty was a perfect fit, and that the edge of the crown under the margin of the gum formed a shelf for the lodgment of food, which decomposing formed toxins which eventually caused the death of the peridental membrane in adults, causing absorption of the alveolus and the development of Riggs' disease.

Dr. Fones believes that everyone who has passed the age of thirty-five is susceptible to Riggs' disease in some form, it being simply a question of degree. About this age the peridental membrane gradually becomes thinner, and as it grows thinner it is less vascular, and with a lessened vascularity the cells do not possess the vitality and resisting power they had in youth. This contraction is also observed in the Haversian canals in the alveolar process. The exciting cause which produces the death of the cells of the peridental membrane at its periphery is the poisonous products formed by the fermentation, decomposition, and putrefaction of food debris from the action of micro-organisms. Faulty metabolism and constitutional debility would heighten the susceptibility, and extreme unsanitary conditions of the mouth would aggravate the exciting cause.

There were five clinical reasons why he believed this to be the case: (1) Riggs' disease is rarely found in youth. The peridental membrane is thick and vascular, with sufficient vitality to resist irritating products of decomposing food. (2) It usually attacks teeth in pairs the same as with dental caries. It shows susceptible tissue affected by decomposing food, the same as tooth-structure in dental caries, both exciting causes being local. (3) Pockets or absorption usually first occur in localities favorable for the lodgment of food, generally in the approximal surfaces. (4) It rarely occurs in mouths undergoing thorough instrumentation and polishing by the dentist at frequent intervals and kept clean by

systematic brushing. (5) It responds so readily in treatment to cleanliness, antiseptics, and thorough systematic brushing, the brushing also imparting a vascular stimulus to the gums which is felt by the underlying tissues.

The models shown were broken-down molars with platinoid screw-posts cemented in the root-canals, projecting high enough to give an extra support for the amalgam. Ivory matrix No. 2 was used to mold the amalgam and give the support necessary to allow pressure in making a dense filling. At another sitting the amalgam was smoothed and polished, making a flush joint between the restoration and the tooth with no chance for any lodgment of food. In second bicuspid where the palatal or lingual cusp is gone a platinoid screw-post was used, and the amalgam was molded into place with the Ivory matrix. These restorations proved very durable and insured cleanliness and health at the necks of the teeth.

Dr. ALBERT W. COWEE, Hartford, Conn. "A New Rubber Heater." This rubber heater is for the purpose of preparing vulcanizable rubber to be packed.

Advantages. The rubber is kept almost dry upon a clean surface to which it will not adhere, and at the temperature of steam. So little moisture collects upon the surface of the rubber that an ordinarily dry plaster investment will absorb it, leaving the rubber in such a condition that it will adhere quite firmly to the plaster.

Construction. There are two forms, which we will designate as "No. 1" and "No. 2." No. 1 is probably the most practical for general laboratory use. It consists of two brass or copper rings one-sixteenth of an inch thick and three-quarters of an inch deep, with a circumference of about seven inches, one ring fitting easily within the other. These measurements seem to me to answer best the requirements of general utility. To the outside of the outside ring are soldered or otherwise attached two supports

and a handle. The supports are pieces of wire about one and a half inches long, attached perpendicularly, and the handle is a loop of wire attached in the same way; these rest on the edge of the water pan and so support the heater. To complete the apparatus a piece of cloth (an old towel will answer the purpose) is laid smoothly over the smaller ring and the larger ring is forced over it. This tense cloth offers the surface upon which to lay the pieces of rubber, and when the whole is allowed to rest over a basin of boiling water the desired results are obtained. In No. 2 the place of the inner ring is taken by a parallel-sided basin over the top of which the cloth is laid and a plain ring forced down to hold the cloth in place. A hole in the side of the basin, preferably one that may be closed, for the escape of surplus steam, is a convenience.

Dr. F. L. MARSHALL gave a clinic—"The Various Uses of the Staple Crown"—showing the crown used as a bridge abutment; as a support for a frail tooth; as a retainer for gold or porcelain inlays, also its use with porcelain facing in restoring a bite in teeth badly worn by abrasion.

Dr. C. F. C. MEHLIG, New York, N. Y. "Porcelain Inlays of High-fusing Body." The preparation of cavities is made with Mehlig's new inlay bur, whereby the cavity walls are so formed that the matrix may be removed without springing or changing it. The bur has a cylindrical head with rounded corners; the sides and rounded corners are cut like finishing burs, but the center of the face is left smooth so as to prevent cutting the floor of the cavity and not to injure the pulp. The preparation of the cavity should have, above all, straight or evenly curved sharp lines; all sharp angles must be avoided. The walls or margins are polished with diamond-charged engine instruments.

The matrix is now formed, using platinum foil 1/1000 inch thickness for large cavities, and 1/2000 inch thickness for

small. A piece of foil larger than the cavity is placed over the cavity and pressed in with spunk. If folds appear they must be burnished out and the edge must be well defined. Gum camphor may be packed in the matrix, which will enable us to remove the matrix without changing; the gum camphor is burned out or washed out with alcohol. This will leave the matrix in a clean condition, and it is ready now for baking. The bodies for inlays are high and low-fusing. The clinician has tried all and greatly prefers the high-fusing; the body used at the clinic being Whiteley's, from which he has derived the best results. To obtain the best results in color, select or mix colors to be a shade lighter than the tooth when fused, for generally the cement will darken the inlay when cemented. Different colors of cement play an important part in this problem, and experience alone seems to be the best teacher to obtain perfect results. A few points of importance in regard to fusing the inlay should be observed. To prevent feather edge on the inlay the powder must be brushed away from the edge of the matrix so that it is absolutely clean. Two or more bakings may be necessary to complete the inlay, depending on the size of the inlay and the shrinkage of the body. When the inlay is finished it should have an even glazed surface, but care must be taken not to overheat it, as there is danger of burning out the color, which trouble is so often found in using the low-fusing bodies. This reason alone is sufficient to induce one to confine himself to the high-fusing bodies.

The inlay when baked and ready for cementing should be grooved with a small diamond-charged copper disk around the edge so as to form undercuts, or it may be etched with hydrofluoric acid, and washed with alcohol. The cavity is also grooved at parts best suitable for undercuts, and also washed with alcohol, then dried and kept dry until the inlay is placed and the cement is hard. Cover the lines of cement with wax, paraffin, or sandarac to exclude moisture. If there be any sharp overhanging edges after the

cement has been removed, they should be polished off with fine disks or Arkansas stones, pumice, and precipitated chalk. If these rules are followed, combined with judgment, success should be the reward.

Dr. F. L. FOSSUME, New York, N. Y.
"The Construction of the Porcelain Inlay Matrix with Ivory Instruments." The clinician's set of ivory instruments for the construction of matrices for porcelain inlays consists of twelve burnishers, which number he believes sufficient for constructing the matrix in any cavity where such a filling is suggested. The advantages in using ivory instruments are that they do not stretch or iron the metal, and consequently the matrix will adapt itself into the cavity much more readily, and will be entirely devoid of that springy and rigid condition which makes it difficult to obtain a perfect matrix—without which a well-fitting inlay cannot be constructed. He found, especially with platinum, that he had to anneal two or three times when using steel instruments, because the metal became so rigid. This had not been necessary since adopting ivory burnishers, and it is comparatively a pleasure to construct a matrix when the metal works so plastic. He always prepares cavities with fissure burs which have flat cutting edges at the point, because a cavity with flat floor is wanted, and the walls as nearly parallel to one another as possible, and almost perpendicular to the floor. If this method be carried out the finished inlay will be shaped like a block of almost uniform thickness, free from feather edges, and when placed in the cavity will not slide or rock; then when cemented, the filling will not be likely to come out.

Dr. FRED. A. PEESO demonstrated different methods of restoring missing teeth by inserting removable bridges, and also different styles of anchorage or abutments for removable work. The first and most common of these attachments was the telescope crown. This consists of an

inner cap telescoping a perfectly fitting outer cap, to which the bridge is attached.

This was shown in several specimen cases. One case was where the three lower left molars were missing and had been restored by the use of an extension saddle, the two bicuspid serving as supporting or retaining abutments and carrying telescope crowns.

In two other cases, an upper and a lower molar carried telescope crowns, the mesial end of the bridge being supported, in the upper with a tube and split pin in the canine, and in the lower, with a spur resting in a gold filling inserted in the lingual side of the canine and which had been grooved and countersunk to receive it.

In restoring a missing central incisor in the upper mouth, the remaining central had been devitalized and an iridio-platinum tube inserted. This carried an accurately fitting split pin which was bent and attached to the central dummy. The distal side was supported by a spur resting in a countersunk filling in the lateral.

Another case showed an inlay attachment in a lower molar, the natural crown of the tooth being preserved. The molar was devitalized and a gold inlay with a tube extending through it to the bottom of the pulp-chamber was inserted. The inlay was grooved from the tube to the mesial side and a split pin fitted to the tube and in the groove and attached to the bridge. The mesial end was supported by a spur in a gold filling in the bicuspid.

Another case showed the inlay as connected with a gold crown.

Dr. J. E. DUFFIELD, Hartford, Conn.
"Baked Porcelain Restorations of Broken

Bridge Facings." In the employment of the method to be described, it is necessary that the pins remain intact in the backing. After clearing away all particles of porcelain which may be adhering to the pins from the fractured facing, a cement filling is built around the same, making the sides parallel, and extending in a lateral direction only far enough to include the overhang of the pinheads, the filling being flush with the tops of the pins; the object being to permit of the free drawing of the matrix about to be made. Platinum foil, gage 1/1000, is then burnished over the entire backing. The matrix is then removed and a quantity of tooth-body of the desired shade is placed on the matrix and fused.

There now being no danger of destroying the perfect adaptation from handling, it is again placed in position on the backing and a porcelain veneer or plate tooth from which the pins have been removed, and of a proper shade, is ground in position; additional tooth-body is added to the matrix and the under side of the veneer, which is then placed on the matrix and gently pressed into position; apply a few blasts of hot air to carry off the superfluous moisture of the body, then with an excavator the matrix and veneer, as one piece, is gently lifted off the backing and allowed to fall on a doily. It is then placed in the furnace and fused, the platinum foil stripped off the back, and with a small diamond disk the box or countersunk cavity is undercut, when on removing the filling from the pins in the backing the work is ready to be cemented in position.

If the operation has been carefully executed, we now have a repair which in point of contour and adaptation is eminently satisfactory, and one which is approximately as strong as the original.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, March 1904.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, March 15, 1904, at the Academy of Medicine, No. 17 West Forty-third street, New York city, the president, Dr. Hart, occupying the chair.

After the transaction of routine business,

Dr. M. I. SCHAMBERG, Philadelphia, the essayist of the evening, read the following paper:

THERAPEUTIC VALUE OF THE X RAYS IN DENTISTRY AND ORAL SURGERY.

There are probably no remedial agents the properties, uses, and limitations of which become definitely known until after years of scientific research and clinical experimentation. The X ray proves to be no exception, for whilst much progress has been made in the field of X-ray therapy during the short period since the discovery of its curative influence, there is much still to be learned relative to the dosage, technique, and possibilities of this wonderful agent in the treatment of diseased tissues.

At first the X ray was heralded as a cure for cancer. Later it was tried upon lupus, and was found to rival Finsen's light in its effect upon that disease; and now it is being experimented with for the relief of many affections of benign as well as of malignant nature. In fact, there is no branch of medical science which is receiving more attention than that which pertains to radio-therapy. Specialists in almost all departments of medicine are eagerly testing the value of

this agent in the management of obstinate conditions which come under their care. It is a singular fact that many diseases which have been more or less non-responsive to other forms of treatment have yielded to the remedial influence of the X ray. It is therefore not surprising that radio-therapy has taken such a strong hold on medical and lay minds and that its indiscriminate employment has resulted in many failures.

That the X ray is a valuable therapeutic agent is a certainty. That it has its limitations is equally true. It would be indeed surprising if it had proved to be a panacea for all ailments. Conservative observers recognize in the X ray a remedy capable of great good in appropriate cases, but having distinct limitations. With the X-ray enthusiast who claims cures of innumerable diseases on one hand, and the surgeon who gives but little credence to the value of the rays in the so-called surgical diseases as his opponent, it requires the keenest judgment upon the part of the general practitioner to arrive at the truth.

During the past year the writer has had an opportunity to observe the remarkable influence exerted by the rays upon certain diseases of the skin. The encouraging results achieved by dermatologists in the treatment of lupus, superficial epithelioma, acne, and other dermatoses prompts the belief that many similar affections of the mucous lining of the mouth, if properly reached by the X ray, might likewise respond to its influence. From time to time reports have appeared in medical literature indicating that the

X rays may be successfully employed in the treatment of certain pathological conditions in and about the mouth. For a year or more I have been using the rays in a variety of conditions connected with the mouth and face. In some of these cases the opportunity was not given for an exhaustive trial of the remedy, and absolute conclusions cannot therefore be drawn from these observations. The character of the conditions treated and the results obtained are briefly appended:

A man sixty-two years of age presented himself for treatment with an extensive epithelial cancer involving the buccal and alveolar mucous membrane of the left side of the mouth. The patient, refusing operation, was subjected to X-ray treatment. Twenty-eight applications averaging ten minutes in duration were applied during a period of two months. The rays were applied through the cheek and directly to the mucous membrane through a lead funnel. Despite this treatment the growth increased in size, causing a considerable tumefaction of the subcutaneous tissues. The man subsequently passed from my observation, and he became an inmate of the National Military Home, where he has since succumbed to the disease.

It is a well-known fact that cancers of the buccal mucous membrane are dangerous growths, difficult to cure by any means, operative or otherwise. Those that are in the best position to judge are of the opinion that cancers in this region had better receive prompt surgical treatment rather than be subjected to the X rays. Moreover, it is a difficult matter to exert a favorable influence upon such a condition in the mouth without producing extensive structural changes in the overlying skin penetrated by the rays. In fact, in all forms of deep-seated cancer the rays are inferior to surgical interference, and should only be employed in inoperable cases or as a palliative for the relief of pain. Most superficial epitheliomas are curable and for cosmetic reasons such growths upon the face are best treated by the X ray.

A physician aged twenty-seven came under my care for X-ray treatment for an epithelioma on the side of the face. The growth was of three years' standing, having recurred after removal by curetting and cauterization. Sixteen applications, averaging six minutes in duration, extending over thirty-nine days, resulted in the complete disappearance of the lesion. Three months have elapsed since the treatment and there is no sign of recurrence.

Leucoplakia, a frequent forerunner of buccal carcinoma, is a condition commonly seen in the mouths of heavy tobacco users. It would seem reasonable that a surface affection of this kind might favorably respond to X-ray treatment, providing the case were seen early and treatment vigorously applied. In a severe and long-standing case the course of which I had the opportunity to follow, involving the greater part of the dorsum of the tongue, the disease was favorably influenced by X-ray treatment, but subsequently relapsed. In this instance the condition might have yielded to continued vigorous treatment, but it was not felt to be warranted to expose the patient to the danger of a severe burn.

Tubercular glands, so frequently found in the region of the neck, are reported in a number of instances to have disappeared under application of the X rays. In enlarged glands of non-tuberculous origin similar good results have been obtained. The prompt disappearance of an enlarged gland in the following case indicates the advisability of trying this method in any glandular tumefaction before resorting to the knife.

A young woman twenty-four years of age was referred to me by her physician for X-ray treatment for an enlarged gland of the neck immediately beneath the ear. The gland followed the line of the anterior border of the sterno-cleido-mastoid muscle, was one and a half by two and a quarter inches in measurement, and was tender to the touch. It was not influenced by previous internal medication or topical applications. Other causes being excluded, the family physi-

cian ascribed the appearance of the growth to oral or pharyngeal infection. Eight ten-minute treatments during a period of twenty days caused the gradual subsidence of the enlargement, and though eight months have elapsed since its disappearance there has been no return.

The X rays have been noted by many observers to have decided analgesic properties. It has often been noticed that pain has been completely relieved in cancers and other growths subjected to the rays. This valuable property of the X ray has suggested its use in the treatment of obstinate neuralgias and allied conditions. A number of references will be found in the literature concerning the successful application of the Roentgen rays for this purpose.

Dr. Charles Lester Leonard, a well-known Philadelphia X-ray specialist, says in this regard:

"Some of my most interesting and valuable work has been in this direction—curing neuralgia. One patient I have lately had is the brother of a prominent physician of Philadelphia, who had neuralgia of the nerves of the face for twelve years. The pain extended along the superior and inferior dental nerves on both sides. His teeth were loose in their sockets, and he had been rinsing his mouth with Jamaica ginger with a little glycerin as a remedy. That case showed almost miraculous improvement under the X ray. Three exposures of five minutes each to each side resulted in completely relieving the pain. After two weeks' treatment his teeth resumed their natural position in their sockets.

"Another case, which was under the rest treatment for two weeks last year without improvement, was that of a lady who was suffering from neuralgic headaches affecting the frontal nerves on both sides, in conjunction with sick headache. After treatment with the X ray, the neuralgic symptoms entirely disappeared. She stated that her head felt 'as if it wanted to ache,' but there was no pain. Another case of neuralgia of the supra-

orbital and infra-orbital region was cured by five applications of three minutes each in two days' time. Here we see apparent cures, and a way open for the cure of most forms of neuralgia."

The only case of neuralgia in which I have employed the X ray was in the person of a trained nurse who had been suffering for a year or more from an intermitting pain over the left side of the face. The pain was particularly referred by the patient to a depression on the gum where the process had been removed during the extraction of a tooth. Incision of the scar was followed by relief—which, however, was of short duration. The face was then vigorously exposed to the X rays for five minutes. This was followed by cessation of the pain. A letter received from the patient three weeks later informed me that there had been no recurrence.

Some reservation must be made in this case as to the actual curative influence of the rays, owing to the brevity of the treatment and the fact that the patient was a neurasthenic. However, the patient felt highly pleased with the result and attributed the cure to the X-ray treatment.

It is important that all cases of trifacial neuralgia should be carefully studied from an etiological standpoint, for the cause can often be found in an offending tooth or some equally benign condition amenable to ordinary treatment. Where, however, such causes are excluded and the case is one of persistent neuralgia, the X rays should be employed before radical surgery is resorted to.

Pyorrhea alveolaris or Riggs' disease, being a pathological condition which frequently responds but slightly to well-directed treatment, is one of the diseases which we as dentists are most anxious to favorably influence through the medium of the X ray. For that reason it is not surprising that a number of men are now experimenting with the treatment of this disease by radio-therapy. Personally, my work in this direction has been so

limited that I am not prepared to offer any conclusions. In the few cases that have come under my care but one or two X-ray treatments were applied, and I am not satisfied that the improvement which followed was as much due to the X-ray treatment as it was to other local and constitutional measures instituted in these cases.*

It is quite possible that the X rays will find a field of usefulness in dental conditions other than as herein mentioned. We do not yet fully know the possibilities nor the limitations of Roentgen-ray therapy in the treatment of affections of the mouth. It is quite reasonable to believe that the rays may be advantageously employed in incipient and chronic abscesses, in fistulas with indolent granulations, in the reduction of hypertrophied scars, in chronic antral diseases and allied conditions. Time and further experimentation will alone shed the necessary light in this direction. It is important for workers in this department of medicine to cultivate a conservative spirit, and to maintain a fair, judicial attitude in order that a proper estimate of the value of the X ray be arrived at. To this end it is desirable that negative and unsuccessful results should be reported as well as favorable ones.

Discussion.

Dr. SINCLAIR TOUSEY. In my own work I make a more varied use of what we might call photo-therapy. I find the X ray alone will not accomplish as good results as the X ray combined with the ultra-violet ray—either from the Finsen lamp or a modification of it. In my own treatment for pyorrhea, which I will allude to in a few moments a little more at length, I use the X ray and also apply

these vacuum tubes, with a bulbous extremity connected with one pole of a very powerful coil such as is used for producing an X ray. The patient has hold of a metallic connection coming from the other pole. When the current is turned on, the region being of course sensitive, we would not use as high voltage as for a case of paralysis.

For these cases it is applied to the outside of the face, and produces the effect of this light, and also an effect from the ozone upon the surface, and is also carried into the tissues by the current. The ozone we become accustomed to, but a new patient who comes in notices it at once. I had occasion to treat a physician some little time ago, and when he came in again he said he smelled the ozone the morning following the exposure.

We have a current of very high voltage and considerable ampèreage. It differs from the static machine altogether, in the fact that we have an ampèreage of 125 milliampères attached to this tube, which is applied locally. We obtain many times the ampèreage of the static machine. With the static machine, even those tremendous sparks have only one two-hundredth of a milliampère.

As to whether the superficial cancerous effects are more easily reached than the deeper ones is a question that has puzzled me exceedingly. Two of the cases which I succeeded simply in holding in check for a couple of years have been like the case of epithelioma which the essayist showed. One involves the bones and the cavities of the nose, showing principally on the outside, and the other simply the soft tissues of the lower eyelid. Do what we would, we have not been able to cure them.

On the other hand, there is the case of a woman fifty years old, in which we have been able to cure apparently a very deep-seated affection—a very large fibroid of the uterus, which she had had for a number of years. A year ago last month she went to the Presbyterian Hospital for operation. Under ether it was found that the whole pelvis was one solid mass of cancer, and there was simply no ré-

* [Since this article was written there has appeared in the *Dental Summary* for March an article by Dr. Weston A. Price on "The Treatment of Pyorrhea Alveolaris with the X Rays." His experiments are conclusive, and prove the X rays to be of unquestionable value in the treatment of this obstinate disease.—M. I. S.]

moving it at all. They took away a piece of the cervix to verify the diagnosis of carcinoma and let her go home, expecting her to die in about six weeks. She was brought to my office. At first she came in a carriage, with a nurse, a physician, her mother, and her husband. She had a frightful discharge with a very bad odor. She was very miserable, and was often not able to keep her appointment. If she had one for Tuesday, she would possibly arrive Saturday. We made application of these high-frequency currents—the vacuum electrodes I speak of with the 10,000 waves of ultra-violet light—over the regions of extreme pain—which I thought was due to the stretching of the broad ligaments. The pain was the first thing to stop, then the discharge and the odor, and then she began to take in her clothes at the rate of two inches every week, indicating the disappearance of the fibroid. She began to be stronger and would keep her engagements more regularly; gradually she dispensed with the assistance of her nurse, her physician, her mother, and then her husband. The last few weeks she came to me she was traveling on a street car, as fine a looking dowager as you would want to see, with a box of candy or some fruit to take to some sick friend. I turned her over to her physician on the 6th of August, and she is still well and happy—no return of the carcinoma, and the fibroid is only half the size it was when we began. You see you can hardly determine beforehand which are the cases in which you will succeed and those which will prove failures.

I have seen a case of sarcoma of the jaw with a long, slow history; it must have been an osteo-sarcoma; that case eventually got well under the X-ray treatment. As the essayist says, the cancerous growths of the bone are generally difficult cases.

In my own work, I have practically abandoned the use of sheet lead screens and protections for the patient, and use X-ray tubes (which the essayist alluded to) of special construction, throwing the light only in one direction. One of my

own tubes throws the light almost the same as if we were directing the light of a dark lantern.

The X ray itself certainly stops pain—as in cancer of the stomach, for instance.

I can corroborate the doctor's observations on the neuralgia question. Sometimes the static machine, in cases of neuralgia of the face, works better, and is not open to the objections of the X ray.

As for cases of Bell's paralysis, these vacuum electrodes—high-frequency currents—would be suitable. My experience with that began on two cases of infantile paralysis. I call the treatment I was giving them "X-ray treatment," because I group the whole thing; all the work I do I call "X-ray work," whether it is static machine, or high-frequency currents, or the Finsen light. One little child had the typical infantile paralysis. One poor little arm was all crippled up and stiff, and the leg the same way. In the course of a few months that side was strong as the other, and the child became fat and jolly.

During the past two years a very great deal has been done with the X ray and kindred applications as an adjunct to the mechanical and chemical treatment of pyorrhea alveolaris. During this time reports upon the subject of pyorrhea have been published by Finsen, Parker, Hickey, Guy, Schwartz, Robin, Römer, Achorn, Suye, Talbot, Stewart, Logan, Price, Newell, Goadby, Burchard, Ames, Grieves, Cook, Bödecker, Choteau, Rhein, Peacock, Bester, Von Wolrozyński, and in the *Dental Annals*, in *l'Odontologie*, in *Pathologie der Zähne*, etc.

From these reports we gather that the probability is that the ordinary pus organisms, such as the staphylococcus, *Bac. pyocyaneus*, *Bac. coli communis*, etc., have no direct share in the production of pyorrhea alveolaris, and that the pneumococcus is also absent; probably a member of the yeast family is the pathogenic germ. The constitutional conditions are often due to poisoning by toxins, and a filtered broth culture from

these teeth kills guinea-pigs. The constitutional cause is frequently rheumatism or gout. (Newell.) This observation I can abundantly corroborate. Much of my own practice in electro-therapeutics consists in the constitutional treatment of uric acid diatheses and diabetes, and among these patients there is a marvelous percentage of Riggs' disease. The teeth themselves are generally free from caries, and the dental tissues are highly organized. Some cases arise from—(1) A primary gingivitis, with the formation of hard scaly dark calculi beneath the gum margin. (2) The gingivitis is not marked, early deposits may be absent, and there is phagedenic pericementitis. (3) In still other cases degeneration and necrosis of the pericementum and deposits of calculi occur upon the lateral aspects of the tooth-root, the gum margin being normal. (Burchard.)

The clinical appearance is described by Guy in the *Dental Record*, reviewed in the *Dental Digest* for September 1903. In his patient there was chronic enlargement of the submaxillary glands; the lower incisors, canines, and premolars were all very loose; the gum festoons hung patulous away from them; the gums were unhealthy, spongy, livid, and almost purpuric; pus exuded freely from about the roots of the teeth; the two upper incisors and a number of roots required extraction. The teeth were hypersensitive to thermal changes.

In one of my own patients there was such great pain all along the right half of the lower alveolar margin as to confine her to bed for several weeks, during which time the dentist had to visit her twice a day. She came to me six months later for constitutional treatment for indefinite digestive distress, with rheumatic or neuralgic pains and with an excess of uric acid and a large amount of sugar in the urine. This is a condition which yields to the application of high-frequency currents and vibratory massage, and these were applied over the abdomen, the spine, and the affected joints. A few applications of the X ray by my special tube were made to the teeth. The result

is apparently a perfect cure, but it could not have been accomplished without the local applications by the dentist.

An ordinary X-ray tube has its main portion spherical and the entire half of the tube in front of the plane of the platinum disk is brilliantly lighted up by a green light. The special X-ray tube which I have devised for the application of the X ray to the treatment of pyorrhea is made of lead glass, and is opaque to the X ray except a cylindrical prolongation, from the end of which the rays go in a straight line, and none of the X rays go in any other direction, the light being absolutely localized to an area about an inch and a half in diameter, and the end of the tube is so shaped as to be convenient for application to the gums. If a great many treatments are necessary, of course the X ray, if allowed to shine through the lips, would eventually cause a loss of the hair upon the lip, so that in such cases this special tube of mine ought to be applied with the lips separated. For a few applications, or for the purpose of taking a picture, the X ray can be allowed to shine through the lips without any disturbance of any kind being produced.

The process by which I take pictures of the teeth and of tooth-roots, supernumerary teeth, fractures of the jaw, etc., employs a piece of sensitized paper which is wrapped in opaque black paper and protected by thin rubber tissue; it is placed inside the mouth and pressed against the jaw, the light being allowed to shine from the outside of the face, and it is not necessary to use a special X-ray tube, the large spherical X-ray tube being perfectly adapted to the purpose. The distance is about ten inches, and the time of exposure required is from twenty seconds to a minute. After making the exposure we take a piece of sensitized paper out of the envelope and drop it into a developing solution and later into a fixing solution. This can all be done in any comparatively dark room, and this is one great advantage of this method. Another advantage is that we have in five minutes a complete picture

(print), which may very probably show not only the roots of the teeth, but also the entire pulp-cavity, extending down to the tips of the roots.

A picture which I have here is that of the lower incisors in the case of a lady whom I have treated for pyorrhea by means of the X ray and high-frequency currents. These high-frequency currents are produced by the same X-ray coil, with the addition of a D'Arsonval transformer and vacuum electrodes. These vacuum electrodes are simple glass tubes, which contain a partial vacuum. They are of various shapes and are applied directly to the surface of the body, and when the current is turned on, ten thousand waves of violet colored light pour down through the vacuum and disappear in the body every minute. The test by means of Willemite—this is also used in testing radium—shows the presence of ultra-violet rays in very rich abundance in this light. From these tubes there is produced a large amount of ozone right on the surface of the body, and this is carried in by the current. The electric current itself passes into a metallic handle which is held by the patient, and when the vacuum electrode is applied to the seat of disease the current passing through the patient has greater efficiency than in any other form of application.

The whole application is devoid of any uncomfortable sensation. In fact, there is practically no sensation except that of the actual contact of the glass with the surface. It is used by me with very great success in the treatment of rheumatism, gout, sciatica, paralysis, neuralgia, and as an adjunct in the treatment of tuberculosis.

One case of pyorrhea which I have treated had been under the care of Dr. Jones, a dentist of Birmingham, Ala., for a couple of months. The treatment had been very successful indeed, and consisted in almost daily applications of some caustic substance which destroyed the inflamed and necrotic tissue about the roots of the teeth. This subsequently gave place to a new and firm tissue with

the loss of only two teeth. She had been suffering from the disease for six years before this course of treatment was undertaken, and when she came to New York there was very little of the original condition to be seen, and that little has disappeared entirely under the use of the vacuum electrodes and high-frequency currents applied through the lips. At the same time this patient has been cured of an epithelioma of the face by the X ray.

Dr. WEISSE. I was interested in the reference to cases of trifacial neuralgia in which the pain was relieved by the application of the X ray. That is a field of great importance. I have had no experience in its application to such cases, but I know something about the suffering of patients from that trouble, and the hopelessness connected with it. If the X ray is going to afford relief it will be a great thing, and I shall look forward to having the cases that present themselves to me in clinical work submitted to the treatment. I hope the results of my experience will be as favorable as that of the gentlemen who have spoken to us to-night.

I notice that no reference has been made to applications of the X ray directly into the buccal cavity; the only one was a case of a fibroma on the inside of the cheek, and had no bearing upon X-ray work whatever. In the other cases that were related the current was transmitted through the lip, and it was only in superficial or skin cancer, etc.

We are making experiments with the X ray for the treatment of pyorrhea by direct application to the gums, and also to conditions of alveolar abscess after extraction of the tooth, by direct application to the gum. The few cases that have been under treatment up to the present time have certainly been benefited. I would state that with a reservation, however, for nature has much to do with the improvement where these conditions occur. The cases of cancrum oris that were presented on the screen are certainly hopeless without the aid we can offer them. We know there is a bacillus known

as the Lingard bacillus, that has been considered the cause of cancrum oris. Some authorities have confirmed this observation of Lingard, while others have not. It seems to me that these cases, from their steady progress and their continuous ravages of tissue, indicate that there must be some bacterial influence to produce such destruction.

I have also in these cases thought it would be well to apply to them a strong escharotic. I call to mind the treatment with bromin that I used during the Civil War in cases of hospital gangrene. One of the experiences that came out of the war, as far as the surgeon was concerned, was the use of pure bromin in arresting those conditions of phagedenic ulceration. The application of the bromin is painful, and in our use of it in the army the patients were placed under an anesthetic for its use on large surfaces. In such cases I have no hesitancy in using the bromin, realizing its great germicidal effect.

Dr. M. L. RHEIN. There is a great field in the treatment of pyorrhea for the apparatus that Dr. Tousey is using. I have seen sufficient benefits derived from the ordinary X-ray applications, both in these cases and in forms of chronic abscess, such as the essayist alluded to, to believe we are at the outset of quite a radical change in our treatment of certain forms of indolent cell-activity in the mouth. Dr. Tousey assumes that he will find a pathogenic form of bacteria in it, but I think he will find that he is unable to isolate any pathogenic form; the form of bacteria is of a mixed type.

The field is one that is very attractive at the present time, and I want to say that it is absolutely impossible—it is absurd almost—to expect the results that I have seen, unless we have had the proper preliminary surgical treatment of pyorrheal cases. Unless that be done, in the thorough way which we recognize as a necessity, the application of this radio-therapy is of very little value. There is a type of indolent cell-formation, such as we have frequently heard

described as a fungous growth, where there is present the giant-cell formation of tissue as the main incubus against the re-establishment of healthy conditions. In this type of case, we have reason to believe that we may hope for the real cure of this form of pathogenic condition.

Dr. WM. B. DILLS. In regard to facial neuralgia, I had a patient suffering from an impacted lower third molar. I did not expose the face for the purpose of obtaining a therapeutic effect, but to note the exact position of the tooth. I made an exposure for about six seconds, and had taken the film to develop; when I returned, the patient said I had relieved her of pain. I was somewhat surprised, as I had not tried the X ray for relieving the neuralgic pain.

Dr. SCHAMBERG. In reference to the high-frequency current as spoken of by Dr. Tousey, I have not experimented in that direction. We have some high-frequency tubes, and in applying them to the palms of our own hands we find that the current is very similar to the X ray, in that if you hold a tube against the hand you can probably produce an X ray from the hand. It acts as the anode—you have a cathode in the tube—and you very frequently see the green emanations upon the hand, which indicates that the cathode ray striking against the anode produces a very mild X ray. It may be that I am losing sight of the value of this form of treatment—the high-frequency—but I have not entered much into electro-therapeutics. I have tried the X ray in my work where I do not want to subject the cases to surgical operations, and I find it decidedly helpful.

In regard to the difference in results achieved by different operators upon individual cases, as to whether deep-seated or superficial cases respond most readily: that depends largely upon the technique employed. Some men use more vigorous applications; some believe in stopping the treatment for a while. Then, again, idiosyncrasy plays a part; some patients respond more quickly, just as some re-

spond to internal medication better than others.

In regard to Professor Weisse's remarks: I imagined you would be disappointed in that I touched so little upon the value of the X ray to the dental practitioner therapeutically. I do not believe it is of great value to you. I do not think the results in the treatment of pyorrhea have been sufficiently conclusive. In fact, I do not think we have been sufficiently conclusive in any direction. If my paper has stimulated a little enthusiasm and aroused some men to activity in this direction, it will have accomplished its purpose. If it deters men from recording cases that are questionable, it will also have fulfilled a mission.

The case Dr. Weisse spoke of, of phagedenic ulceration of the mouth, I believe to be somewhat different from cases of cancrum oris, inasmuch as it runs some length of time. In cancrum oris I find a favorable or a fatal termination in about two weeks. Cases usually run a very rapid course.

I am thoroughly in accord with Dr. Rhein's view of the value of the X ray in the treatment of pyorrhea. I spoke very little on the subject in my paper, because I thought he could do the subject better justice than I, in laying due importance upon the removal of the deposits from the teeth. There is no question in my mind that the X ray will not remove the deposits from pyorrheal teeth, and the only service it will render in that disease is, as the doctor indicated, to stimulate the cells to a healthier activity.

I feel that its uses so far in dental surgery are discouraging; in oral surgery there are cases where X-ray therapy is indicated, and where its diagnostic value is undisputed.

Dr. TURNER moved a vote of thanks to the essayist for his very interesting and valuable paper.

The motion was carried unanimously.
Adjournment.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

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Devoted to the Interests of the Profession.

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PHILADELPHIA, SEPTEMBER 1904.

EDITORIAL DEPARTMENT.

ST. LOUIS, AUGUST 29th TO SEPTEMBER 3d.

WHEN this issue reaches our readers the Fourth International Dental Congress will be an accomplished fact and the center of the world's dental professional activity will be in St. Louis. No similar movement has been fraught with greater importance to dentistry, none has involved wider interests or enlisted more strenuous endeavor to bring it to a successful issue. It will be the cumulative result of all that has preceded it, the fruit of the evolutionary growth of the international idea in dentistry. The task committed to the care of the Committee of Organization two years ago was not a small one. The conditions surrounding the work of organization were not those which had been met in previous congresses. Larger interests, a wider scope of activity, a greater mass of detail added complexity to the work of the committee. One year of the time of preparation was consumed in reaching a conclusion as to the basis of authority for the work of organization. While this delay was regrettable, and while the settlement of the issues at stake involved at times acrimony and personal feeling, yet, viewed from a broader standpoint, they were issues which were bound to arise in view of the conditions of the time, and we are of opinion that they would have occurred as inevitably had the Fourth International Dental Congress been held in Germany, England, or any other country instead of America, for the reason that the exact relation of the F. D. I. to the work of organization of international dental

congresses had to be determined before the Fourth Congress could be harmoniously organized, and upon the question of that relation the views of able and thoughtful men differed fundamentally.

The question has now been settled, we trust, for all future time, and we hope satisfactorily to all concerned. If that has been done the time and energy consumed in the settlement has not been wasted, but, on the contrary, an important benefit to dentistry in its international relations has been achieved. The curtailment of time in the adjustment of the question of the basis of authority to organize the Congress has served only to stimulate greater activity in the expenditure of what remained. The enthusiastic response which the Committee of Organization has received to all requests for co-operation is the most gratifying feature of the whole work. The dental profession of all nations has lent its support without reserve to the furtherance of this great object. It is true that in some instances, through stress of distance or the expense necessary, the proportion of delegates from certain countries has been small. The Russo-Japanese war has curtailed representation from those nations, yet both have sent valuable contributions and many expressions of sympathetic interest in the meeting. Much praise and honor must be accorded to France, and especially to the Executive Council of the F. D. I., not only for their important contributions to the program of the Congress, but especially for their active and continued furtherance of the work of organization. Perhaps the largest number of contributions to the program, outside of America, will be made by Germany, and the enthusiastic co-operation of her national committee should be gratefully remembered by all who have been concerned in the work of organization.

It is impossible to prognosticate with accuracy what the total results will be as compared with former international meetings, but in point of nations represented, extent of program, and general features prepared for the entertainment and instruction of its members the Fourth International Dental Congress fairly promises to outstrip all its predecessors in importance. It is for this that the committee has labored, and they believe that their expectations will be justified by the event.

And now as to the social aspect of the Congress. Ample opportunity will be afforded to bring members into social contact, and it is from such contact that the best good is wrought out by these meetings. We have referred to this factor before as being in our belief the most important one to be considered. It is important in two definite ways—for ourselves and for our foreign guests. America is a large country, so large that the tendency of many of us is to somehow develop the idea that it comprises the universe, and as a result we become provincial and more or less self-sufficient in our provincialism. The Congress will afford us an opportunity

to find out that there is a portion of the world outside of America that deserves respectful consideration, and our visitors will bring to us something of dentistry that it would be well for us to pay heed to. So also the European has much to learn of America: first of all that we are a pretty good set of fellows, who if perchance we lack somewhat of European *savoir faire* are not lacking in genuine whole-hearted hospitality which will flow freely especially at the touch of the members of our own craft who are for the time being our guests. Both need to know each other better, and now is the time to make the acquaintance and cement it into friendship. Let all go to St. Louis with the determination to take a personal active part in the details of this great meeting and work together for the general good of the profession which it represents.

BIBLIOGRAPHICAL.

DENTAL METALLURGY: A MANUAL FOR THE USE OF DENTAL STUDENTS AND PRACTITIONERS. By CHARLES J. ESSIG, M.D., D.D.S., and AUGUSTUS KOENIG, B.S., M.D. Fifth Edition, revised and enlarged. Illustrated with 76 Engravings. Philadelphia and New York: Lea Brothers & Co., 1904.

Essig's Metallurgy has been for so many years before the profession and the quality of its contents is so well known that to review it critically upon this occasion would constitute a useless repetition of facts.

Prior to the issuing of the first edition dental teachers were often handicapped by the lack of a suitable work on metallurgy in its bearing on problems pertaining to the field of practical dentistry. Appreciating this fact, and desiring to fill this long-felt want in dental litera-

ture, the late Dr. Essig undertook to bring out in book form all the available data on the subject, together with the results of his own original work. His task proved to be a most successful one, and soon after its appearance it became the standard work on the subject. It attained a large circulation, receiving unqualified acceptance by all schools of any standing throughout the world.

The present editor, Dr. Koenig, has added material of unquestionable value to the already interesting production, and has carried it to a level in harmony with the present state of advancement of those branches upon the problems of which metallurgy has a practical bearing.

The typographical work is without fault, and the completed book is a most attractive product.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

[*l'Odontologie*, Paris, July 15, 1904.]

TIC DOULOUREUX OF SYPHILITIC ORIGIN. BY PROFESSOR DEBOVE, Paris.

After discussing the nature of this disorder the author describes the case of a man aged sixty-two years, who for about a year had been troubled with intermittent pain in the region of the superior maxillary nerve. The intervals between the paroxysms became gradually shorter and the intensity of the pain increased markedly. The patient attributed the disease to a "cold," but as this explanation was hardly satisfactory to the surgeon, the examination of the case was carried out further, and resulted in establishing a more accurate diagnosis. The history of the patient, together with the presence of an ulceration on the left side of the hard palate, pointed toward syphilis as the probable cause of the nervous disturbance. The treatment immediately prescribed consisted in daily hypodermic injections of one centigram of mercury bi-iodid. The results of this treatment will be made known in a future communication.

[*Revue de Stomatologie*, Paris, July 1904.]

TREATMENT OF MERCURIAL STOMATITIS. BY DR. PAUL E. GIRES, PARIS.

Potassium chlorid *intus et extra* was an agent very much in favor in past years for the treatment of mercurial stomatitis. Potassium permanganate has also been employed for this purpose, but has now been abandoned, as its bactericidal properties are decidedly weak. Dr. Oppenheim recommends (*Wiener med. Wochenschrift*) hydrogen dioxid solutions both as a mouth-wash and locally upon the ulcerated surfaces. As a mouth-wash he employs the three per cent. solution, and upon the ulcers one of thirty per cent. Muller (*Journ. des Malad. cutanées et syphilitiques*) likewise recommends hydrogen dioxid in solution of from five to ten per cent. or else saturated tincture of iodine applied upon the gingivæ and mucous membrane by means of a camel's-hair brush. This author advocates a prophylactic treatment, which consists in the use of a tooth-paste containing forty per cent. of Wiesbaden salts. The dyspepsia and albuminuria which often develops in syphi-

litics, and which is caused mainly by the administration of mercurial compounds, can be prevented by the hygienic, dietetic, and hydrotherapeutic treatment as given in Wiesbaden. Dr. Muller employs potassium chlorate in cases in which the condition of the patient demands immediate intervention. He employs it in the form of a mouth-wash in solutions of three to five per cent. and never internally, being of the opinion that the effect of potassium permanganate upon the mucous membrane of the stomach is most detrimental.

Dr. Gires remarks that all these agents, particularly hydrogen dioxid, are most useful in the therapeutic treatment of mercurial stomatitis, but emphasizes the necessity of first removing all possible sources of irritation and infection, as no treatment whatever can be expected to eradicate the affection if salivary calculi, carious cavities, roots, etc., are not removed.

[*Deutsche Zahnärztliche Wochenschrift*, Berlin, July 16, 1904.]

RARE CASES OF DENTINIFICATION OF THE PULP. BY DR. HUGO LEVY.

The author reports the interesting case of a patient who sought his services for the treatment of acute pain in the upper and lower right second molars. The case was diagnosed as pulpitis in the upper right second molar, and an arsenical application was there made in view of bringing about the devitalization of the organ. The pain soon decreased, and had disappeared by the next day. A larger opening was made in the crown to facilitate the removal of what was now considered to be a devitalized pulp. Immediately upon the introduction of the nerve instrument into the pulp-chamber it became evident that the coronal portion of the pulp had somehow disappeared. The entrances into the canals were reasonably accessible, but the nerve explorers could scarcely be made to penetrate them. A careful examination revealed the presence of two movable bodies in the canals, which after being carefully removed proved to be the dentinified pulps. One of the bodies comprised the two buccal and the coronal portions of the pulp and the other the palatal portion. While this case is extremely inter-

esting of itself, it acquires greater significance when it is considered that the same degenerative changes were discovered in the lower right and upper left second molars, making a total of three fully calcified pulps in a single mouth.

[*International Dental Journal*, Philadelphia, August 1904.]

NON-EXPANDING PLASTER. BY P. B. McCULLOUGH, PHILADELPHIA.

The author reports the results of his experiments with plaster of Paris, begun in view of devising means by which to prevent, if possible, the expansion of plaster during the setting process. His tests consisted mainly in the mixing of plaster with a saturated solution of calcium oxid in water previously filtered, boiled, and cooled; with lime-water prepared without filtering or boiling; with a solution of gum arabic; and with lime-water to which a little salt had been added. A test was also made with plain boiled water, allowed to cool. Through these various experiments the author found that plaster mixed with a saturated solution of calcium oxid in water filtered, boiled, and cooled does not expand. The gum arabic solution likewise prevents expansion, but the resulting plaster is less dense than when mixed with lime-water.

[*British Dental Journal*, London, July 1904.]

A CASE OF ABSENCE OF THE INTER-MAXILLARIES. BY LOUIS JEFFERY.

The case reported was that of a young woman aged twenty, presenting a dwarfed upper jaw and an exceptionally well-developed lower jaw. Early in life the patient was operated upon for hare-lip, and as a result the upper lip is short and tense. In the upper jaw the space between the canines measures only one-eighth inch, owing to the absence of the intermaxillary bones. To remedy this distracting condition of things the author endeavored to separate the canines in view of obtaining sufficient space for the insertion of the four missing incisors. Appropriate appliances were inserted, and sufficient space was readily obtained, but as the teeth assumed a fan-like position it soon became evident that they would lose all contact with the lower teeth, and this method of treatment was consequently abandoned. It was also found that such a procedure would not give sufficient fulness to the face. The author then decided to conclude the treatment by the insertion of a plate covering the

bicuspid, and attached to them by means of bands. The plate had to be discarded at the end of a year, owing to the great pressure exerted by the lips, and partly by the tendency of the teeth to revert to their old position.

The second denture which was then devised is a most ingenious apparatus. The canine crowns were excised, and to the roots were fitted a cap-and-tube arrangement. To the two caps a gold bar is adapted, fitting closely to the gum, but avoiding pressure upon it, passing externally to the canine roots, and around the first bicuspid on either side. The bar has projections coming over the canine roots, and on its upper surface are soldered three short horizontal tubes, into which slide gold rods projecting backward from the light frame which carries eight anterior teeth. This arrangement, which has now been in use for three years, has improved the appearance of the patient.

[*Archives de Stomatologie*, Paris, June 1904.]

TERTIARY SYPHILIS OF THE BUCCOPHARYNX. GUMMA OF THE SOFT PALATE IN A CHILD OF TEN YEARS. BY DR. R. VOGUÉ, DENTIST TO THE HOSPITALS.

Tertiary syphilitic manifestations seem to have a special predilection for the tissues of the nose, mouth, and pharynx. Any sluggish ulceration developing upon these tissues should be looked upon with suspicion, in view of the possibility of previous syphilitic infection. Syphilitic lesions of the nose are usually complicated by pharyngeal or buccal lesions, and *vice versa*. Tertiary lesions appear on an average of eight or nine years after the appearance of the initial lesion. They may be either of the ulcerous type or of the gummatous type. Ulcerous syphilids are usually located upon the soft palate, palatal vault, tonsils, pharynx, and nose. These are superficial excoriations of the mucous membrane, attaining the size of an ordinary almond, and they usually disappear without leaving any trace whatever of their previous presence. The gummatous form may be either diffuse or circumscribed. The diffuse form is the one of most frequent occurrence. These diffuse gummata are of a gooseberry color, with markedly raised edges. When located upon the soft palate they usually perforate the membrane, which is commonly infiltrated with small gummata the size of a pea. The evolution of these lesions is slow, and it is almost suddenly that perforations occur, establishing communicating avenues between the

mouth and pharynx. Palatal gummata are usually found in the neighborhood of the median line. In the nasal cavity the lesions affect mainly the osseous tissue. The condition thus engendered is one of true osteomyelitis of the palatal vault, with characteristic sequestra of various sizes, and usually lead to perforations of the roof of the mouth. Dieulafoy is very positive in this respect, stating that as a rule, syphilitic rhinitis is the precursor of palatal perforations.

The necrotic process advances from the nose toward the mouth, practically never in the opposite direction. Tuberculo-ulcerous syphilids and gummatous periostitis of the floor of the nasal cavity lead to necrosis and exposure of a segment of the upper jaw. This periostitis is followed up by the formation of abscesses under the mucous membrane lining the under surface of the affected bone. The abscesses open, the fistula thus established becomes gradually larger, the sequestrum separates, and a large perforation of the palate is then established with its accompanying changes in phonation, together with regurgitation of liquid and solid food into the nose. At the beginning a gummatous syphilid presents the appearance of a solid tumor, and causes but slight inconvenience until perforation is established, at which time the functional disturbances make themselves evident. The phenomena following a palatal perforation vary according to the caliber of the opening. When the communication between the two cavities is by means of a simple fissure only a small amount of liquid will regurgitate into the nose, and a faint nasal sound will be noticeable, but when the perforation is larger great quantities of liquid and food materials will regurgitate into the nose, causing unlimited annoyance to the patient. In such cases the nasal sound is of course more marked, the pronunciation of consonants becomes very difficult, and, in one word, speech becomes almost incomprehensible.

These tertiary syphilitic accidents, which the author describes in full, are seldom observed except in adults. They are rarely seen in children, although the case now to be described shows the possibility of their appearance early in life. The subject was a child aged ten, presenting an ulceration of a few days' standing on the median line of the velum palati. The mucous membrane, slightly raised upon an area of about two centimeters, presented a depression in the center, filled up with gangrenous tissue. The ulceration was painless, and neither the mouth nor the pharynx showed any abnormal signs. The

nasal fossæ presented a few slight ulcerations, and a coryza had existed for over one month. A very marked polyadenitis was in evidence in the neck and neighboring areas. The eyes, the osseous system, and the teeth were normal. The child, although not of robust constitution, had always been in good health, but his general appearance was delicate. The lesion on the soft palate, coexisting with the coryza and the adenitis present, favored a diagnosis of syphilis, which was further on confirmed upon questioning the mother. The child was immediately put upon specific treatment, and his rapid recovery, at least from the local manifestation, confirmed the original diagnosis.

Regarding the treatment of bucco-pharyngeal syphilis in the adult, the author recommends the administration of potassium iodid in large doses, gr. lx to gr. xc per diem. To hasten the cicatrization of the ulcerated areas either silver nitrate, acid nitrate of mercury, or the actual cautery may be employed.

[*New York Medical Journal*, July 30, 1904.]
SOME NOTES ON RIGGS' DISEASE AND ITS TREATMENT. BY GEORGE F. SOMMERS, PHILADELPHIA.

The author prefaces the article with the statement that in over a quarter of a century in the realm of medicine the fact has become apparent to him that physicians and surgeons lack correct dental information, and he alludes to incidents in which such absence of proper knowledge has led to unfavorable if not disastrous results. In substantiation of the need of practical dental knowledge on the part of medical men he refers to a number of instances where physicians have advised the immediate extraction of teeth the seat of developing abscesses, and expresses his views against such a procedure, for at times the removal of a tooth under such conditions is followed by violent inflammation of the neighboring structures. The cases of pyorrhea alveolaris which have come under the author's observation have led him to attach considerable importance to the constitutional factor (rheumatism, gout, etc.) as bearing upon the etiology of this malady. Pyorrhea alveolaris of the constitutional type should be treated systemically. If rheumatism or some other vitiated state is found to be a factor in the causation of the disease, a treatment should be instituted having in view the eradication of the constitutional taint.

In reference to the therapeutics of pyorrhea

we find that the author recommends the free use of hydrogen dioxide, aromatic sulfuric acid, and quinin sulfate. He fails, however, to mention one of the most important steps in the treatment of the largest percentage of pyorrheal cases, namely, the removal of all calcareous deposits, whether salivary or serumal, from the coronal and radicular surfaces of the teeth. It is true that in a few isolated cases the surfaces of the affected teeth have been found free from deposits, but these are merely exceptional instances, and of course would not require any scaling. To undertake the treatment of a true pyorrheal case where the root-surfaces are covered with deposits, without first directing one's attention to the removal of all concretions and subsequent polishing of the surfaces to which they were attached would be just as empirical, and the result just as doubtful, as to treat a dento-alveolar abscess by the application of antiseptics to the fistula, if any were present, entirely disregarding the nucleus of infectious matter in the root-canal or canals. Calcular deposits are largely responsible for the production of the pyogenic disturbance, as their presence upon the crowns of teeth and near the gingiva or upon the radicular surfaces establishes a focus of irritation which decreases the vital resistance of the tissues in their immediate neighborhood, thereby favoring subsequent pyogenic infection and tissue destruction.

[*Dental Headlight*, Nashville, July 1904.]

CARE OF CHILDREN'S TEETH. By W. C. GILLESPIE.

Children's teeth should be under the dentist's supervision practically from the time of their eruption. The teeth should be cleansed from all accumulations and from stains as thoroughly as possible. Where incipient decay is evident, grind away with stone or disk, or touch with silver nitrate if decay is beginning in fissures or pits. In more extensive cases prepare the cavity and fill with cement, gutta-percha, copper oxyphosphate, copper amalgam, ordinary amalgam, or tin, according to the conditions present. Where extensive occluso-approximal cavities occur in adjoining teeth it is recommended to fill the floor of both cavities with gutta-percha, then bridge the approximal space with a strip of German silver and complete the fillings with gutta-percha. With amalgam or cement the strips would not be necessary. In cases of pulp-exposure repeated applications of carbolic acid will enable the operator to partially remove the pulp almost painlessly. The root-canals and pulp-chamber may then

be filled with equal parts of iodoform and zinc oxid made into a paste with creasote or an essential oil. The excess of fluid is then absorbed with a pellet of cotton and the cavity sealed with cement.

When exposure is slight, a dressing of zinc oxid and creasote should be applied, after the cavity has been rendered thoroughly aseptic, and cement or some other material should be used in filling the cavity. As a pulp-capping, celluloid dissolved in acetone may be used to advantage, but under no circumstances should arsenic be employed. For filling cavities in deciduous teeth the author gives the preference to cement, as with it less excavating is required than with amalgam. In abscessed deciduous teeth the author suggests to grind off the crown of the affected tooth to prevent its occlusion with the opposing teeth, thereby facilitating exfoliation. The eruption of the permanent teeth should be watched carefully and malocclusion prevented in the beginning, instead of waiting eight or ten years and then subjecting the patient to severe operations to remedy it.

The paper contains a number of valuable suggestions, and should be made the subject of careful reading, particularly by the younger professional element, who often fail to appreciate the importance of the deciduous teeth, not only in their bearing upon the soundness of the permanent organs, but furthermore as factors of undeniable magnitude in the preservation of the general health.

[*Odontologie*, Paris, July 15, 1904.]

EXAMINATION OF THE TEETH OF SCHOOL CHILDREN. BY PROFESSOR MICHEL.

Dr. Michel has examined the mouths of 11,762 children of Wurzburg, 6116 girls and 5646 boys. He has endeavored to discover whether there exists any relationship between the frequency of dental caries and, first, breast-feeding; second, artificial feeding (cow's milk); and, third, the presence of the child during its early age in regions poor or rich in calcareous compounds. Out of the 11,762 children, 7763, or about 66 per cent., had been fed by natural means. These infants were weaned, on an average, at six and one-half months. Caries was found in the proportion of 11.46 per cent. This proportion is eight per cent. less than that found in the remaining children, fed by different means. In 122 children who had not been weaned until after the tenth month the teeth were found to be healthy and regular, caries was found in 6 per cent., and rhachitis in 2 per cent. In chil-

dren who had been weaned before the seventh month caries was found in 13 per cent., and rhachitis in 6 per cent. Out of 900 children fed on cow's milk caries was found to exist in 22 per cent., and rhachitis in 8 per cent.

In a group of 620 children raised on different varieties of proprietary foods caries was present in 27 per cent., and rhachitis in 16 per cent.

From the foregoing statistics it can be seen that children raised on the mother's milk have better and sounder teeth than those fed on cow's milk and artificial foods. The proportion of calcareous salts in the soil has also a bearing on the frequency of caries. Röse found that those originally from regions rich in calcium salts had teeth of better quality than those born in regions poor in those salts. Professor Michel, however, believes that the proportion of calcium salts in the regions in which the children will permanently reside has more influence than that of the region of birth.

[*Revue Odontologique*, Paris, June 1904]

INVESTIGATIONS ON HEMOPHILIA. BY DR. DOMMARTIN.

Dr. Dommartin (*Journal de Médecine et de Chirurgie pratiques*) has collected a considerable amount of data bearing on the pathology of hemophilia. What has been especially established in the etiology of this diathesis is that it is often hereditary and that it rarely develops in women. The form of hemorrhage most frequently observed in hemophiles is epistaxis. An interesting statistical table prepared by Grandidier shows that even small injuries may be the cause of fatal hemorrhages in those of the hemophilic diathesis. In that table we find one fatal case following the rupture of the frenum of the upper jaw, eleven following injuries of the scalp, one following an injury of the foot, seven following the involuntary biting of the tongue, two following slight injury of the finger, fourteen following chapping of the labial mucous membrane, five following epistaxis caused by falls, and one following deep-seated injury of the thorax. The author also recalls Virchow's classical case, too well known in medical circles to require its description in this review.

The same author has collected a list of fatal cases following various operations. The list is as follows: Leech punctures, 4; cupping wounds, 2; scarifications, 4; blood-letting, 6; application of a seton, 1; application of a vesicatory, 2; extraction of teeth, 10; circumcision, 4; establishment of a fistula, 1;

ligature of the carotid, 1; ligature of the radial and ulnar artery following the puncturing of an aneurysm, 1; ligature of the crural artery, 1; amputation of the thigh, 1; amputation of the forearm, 1.

It will be seen that the proportion of fatal cases following the extraction of teeth is far greater than that from any other operation. One of the most interesting diagnostic manifestations of hemophilia is to be found in certain articular disorders caused by the effusion of blood into the articulations. Meynet has classified the evolution of these arthropathies into three periods, as follows: 1. Effusion of blood into the articulations, often accompanied by fever. 2. Arthropathies simulating gelatinous arthritis; engorgement of the joint; amyotrophie—no abscesses or local heat-production. 3. Ankylosis or deformities.

In the first evolutionary period one is confronted with all the signs of a spontaneous hemarthrosis. Occurring in the knee-joint, which will then become tumefied, the patient will be unable to use the affected limb; the pain upon palpation is extreme; the blood effusion is very abundant; the limb is semi-flexed, and the knee-jerk is absent in some cases. An exploratory puncture will bring out a quantity of almost pure blood. No inflammatory signs can be perceived on the surface, the skin is neither red nor hot, but simply distended. A day or two after the effusion ecchymotic patches may be seen around the region of the diseased joint. In some cases fever is present, but more often the patient is free from any feverish sensation. This condition presents for twenty-four or forty-eight hours, then the signs of the effusion gradually disappear, the pain decreases, and the joint returns to its normal condition.

The peculiarity of this hemarthrosis is that it recurs several times, it may be in the same articulation or in a different one. If the attack continues in its evolution it will reach the second stage, which is characterized by chronic inflammation of the articular tissues with objective symptoms similar to those of a white swelling—the hydrops tuberculosus of Koenig, and the differential diagnosis is at times complicated. This stage of chronic inflammation may be interrupted by acute intermediary attacks, which will intensify and aggravate the diseased condition of the joint until it reaches the third stage, that of permanent deformity. On account of the proliferation of fibrous tissue, ankylosis soon ensues, accompanied soon after by muscular atrophy and complete immobility of the part.

These hemophilic arthropathies constitute

evidently a very rare type of articular affections, and may lead to the wrong diagnosis of tubercular infection; the surgical intervention consequently indicated would certainly prove fatal. Considering all the manifestations of hemophilia it must be concluded that the prognosis is indeed most serious. Grandier has observed that out of 152 hemophilic boys 133 died before attaining twenty-one years, and according to Litten's statistics 60 per cent. of all hemophiliacs die before the age of eight, and only 11 per cent. live up to or beyond twenty-two years. The seriousness of the prognosis is the greater the younger the age of the patient.

From the standpoint of seriousness the author recognizes three types of hemophilia:

1. The grave form which is manifested soon after birth, and is characterized by a tendency to profuse, spontaneous interstitial

hemorrhages and arthropathies. This form is very rare in girls, and lasts through life.

2. The medium form, which usually disappears at puberty, and which has no tendencies toward profuse hemorrhages of traumatic origin, but manifests itself by hemorrhages from mucous membranes and subcutaneous ecchymoses.

3. The slight form is found particularly in women, who when thus affected have tendencies to ecchymosis and other accidents during the period of menstruation or during labor.

Regarding treatment the author recommends the internal administration of calcium chlorid in doses of from gr. xv to gr. xxx, provided it be not given for too long a period. Reverdin has recommended sodium sulfate in small doses of gr. 1½ every two hours. By means of this agent he has been able to arrest marked hemorrhages.

PERISCOPE.

To Clean a Spatula.—Let it remain in water for a short while and the cement may be easily wiped off.—J. F. STEELE, *Dental Hints*.

To Remove Inlay Matrix Without Bending.—A good way to remove a matrix from a tooth-cavity is to tie a knot in the end of a thread and lay it in the bottom of the matrix, then cover it with warm wax, which may be pressed perfectly to the cavity walls. When chilled the matrix may be handled with ease.—F. W. HARNDEN, *Pacific Dental Gazette*.

Sterilization of Water.—According to Paterno and Gingolani, water may be completely sterilized by the addition of silver fluorid 1 part to 500,000. A slight turbidity takes place on the addition of the fluorid, but after twenty-four hours the water is completely bright, and the amount of silver remaining in solution is so slight as to be of no importance.—*Chemist and Druggist*.

Secondary Hemorrhage during the Period of Reaction from Shock.—It is during the period of reaction from shock that secondary hemorrhage is to be feared. In order to prevent it, tie all vessels that have been severed even if they are not bleeding, use reasonable pressure through your dressing, and inspect often.—*Internat. Journ. of Surgery*.

Identification of Criminals through the Teeth.—Rather an ingenious suggestion has been made for the further identification of criminals. The finger-print method may sometimes be lacking in exactness. But the dentist proposes that casts shall be taken of prisoners' mouths. There is a vast amount of individuality about teeth; and though losses occur, it is an additional clue to identify a man by the impression of those he has left in his head.—*Dental Record*.

Lip-tie.—Cases of tongue-tie, while uncommon, are of sufficiently frequent occurrence to be well known. F. Griffith (*Annals of Surgery*, March 1904) states that a shortening of the frenum of the lips is not cited in literature. A case recently occurred in his practice in which the subject—an infant of Italian parentage—presented this abnormality to such a remarkable degree that it necessitated operation. The mid-line of the entire upper lip had been bound to the gum by a fold of tissue continuous with the mucous lining of the mouth, one-eighth of an inch in thickness. The teeth were small but well formed. On opening the mouth, the middle of the upper lip rolled directly inward, giving rise to a peculiar expression not apparent when in repose. The direct family history was negative. Treatment consisted in simple section of the frenum.—*Medical News*.

Painless Pulp-Removal.—Equal parts of chloroform and carbolic acid. Using a French syringe (glass barrel, with glass piston, without needle, simply a cannula), pack gutta-percha around the nozzle to prevent escape, and inject, forcing the piston down. The pulp can be immediately twisted out, blanched perfectly white, and insensitive to pain.—*Internat. Dental Register*.

Toothache.—*Nouveaux Remèdes* recommends—

- R—Carbolic acid crystals,
- Menthol.
- Cocain hydrochlorid,
- Chloral hydrate,
- Guaiacol, of each 30 grains. M.
- Triturate to form a paste.

This mixture is caustic and analgesic; its causticity may be increased by adding more carbolic acid.—*New York Med. Journal*.

Dry Treatment of Burns.—Sattler (*Wien. med. Presse*) reports one hundred cases of burns treated with xeroform, which is freely dusted over the inflamed surface and then covered with powder and dressings. These are left undisturbed for six days, and then re-dressed in a bath. The treatment commends itself because (1) it alleviates pain and distress rapidly; (2) the wounds clean rapidly; (3) the raw surfaces are quickly covered with healthy granulations, and the epidermis rapidly closes in.—M. L. H., *Cincinnati Lancet-Clinic*.

To Relieve Tightness of Forceps Joints.—After sterilizing forceps by boiling them in various solutions the joints sometimes fail to work easily, because of the accumulation of sodium carbonate, rust, etc. To remove the difficulty, moisten both sides of the open joint, apply a little loose carborundum powder, No. F or No. 220, and work the joint vigorously until it loosens. Then hold under running water and work until the gritty feeling leaves the joint; then dry thoroughly and oil. This takes about one minute per pair.—P. W. SMITH, *Dental Register*.

Prehistoric Dentistry.—Herr Reiser, a German dentist, has, from a study of a number of prehistoric skulls, come to somewhat remarkable conclusions. Unlike most other observers, he holds that dental caries was largely prevalent among our forbears of the stone and bronze ages, the incisors being in many cases worn away to the root. He says he has found traces of filling on teeth which he examined, from which he infers that there were dentists in prehistoric times.—*Brit. Dental Journal*.

The Koplik Spots.—Ruedel confirms the diagnostic value of the Koplik spots as an early sign of measles. He had occasion to observe an epidemic of the disease; in the majority of cases the exanthem appeared upon the inside of the cheek and upon the soft palate for some days before the appearance of the cutaneous eruption. In cases of rubeola no mucous eruption was observed, while in scarlet fever patients such an eruption was noticed without the characteristic whitish spots, and consisting of many minute red dots, the edges of which were scarcely distinguishable from the surrounding mucosa.—*New York Med. Journal*.

Electrics and Electricity.—While the nature of electricity is not understood, something has been known of its phenomena ever since 600 B.C.—the fact, *e.g.*, that light bodies, such as pith or bits of paper, would be attracted by a piece of amber rubbed with a flannel cloth. But it was not known for the following twenty-two hundred years that any other bodies than amber or jet were capable of this kind of excitation, until Gilbert, an English physician, discovered in 1600 that a great many bodies possess the same property. He styled these bodies electrics. The word electricity was given to the invisible agent by Boyle in 1675.—B. N. PIPPIN, *Dental Era*.

Unreliable Results with the Plastic Impression Materials.—All plastic materials are apt to produce curious, misleading results, the teeth on the model being sometimes too long, sometimes too short. It is at first sight difficult to account for such behavior on the part of any material. There is no doubt, however, that the lengthening is produced by the impression material sticking to the teeth and becoming stretched, and that the shortening is due to the elasticity of the material, which causes it to resume its original shape to a certain extent after pressure is removed.—WM. M. GABRIEL, *Brit. Journ. of Dental Science*.

Oil of Cloves in Carious Cavities.—In all cavities where there is not much decalcified dentin to be removed, as in cervical and small approximal cavities in anterior teeth, oil of cloves, in my hands, produces the most gratifying results. Having the rubber dam adjusted, and the cavity thoroughly desiccated by using absolute alcohol and warm air, gently applied, place in the cavity a pledget of cotton, saturated with the medicament and passed quickly through the flame. Now direct a current of warm air on the cotton and continue until the eugenol,

the constituent of cloves, is completely volatilized.—J. P. BUCKLEY, *Dental Review*.

Asepsis in Tooth-Extraction.—The extraction of a tooth is a surgical procedure, and as such should be conducted under strict asepsis, or as nearly so as can be obtained in the mouth by the use of harmless germicides. It is just as important that the mouth be thoroughly rinsed with an antiseptic wash immediately before extraction as it is after it. Unfortunately, most patients are only impressed with the need for rinsing the mouth to get rid of the blood which accumulates there after a tooth is drawn. They should be made to know the value of oral antisepsis prior and subsequent to any surgical work about the mouth.—M. I. SCHAMBERG, *Dental Brief*.

Trichloroacetic Acid.—I wish to speak a good word for trichloroacetic acid in dental practice, because I believe it has a wider range of application than any other single preparation. First, it is most excellent in the treatment of pyorrhea, arresting the accumulation of pus in very short order. In the treatment of putrescent pulp-canals it acts like a charm; carefully applied to spongy gums it gives better results than anything else; in pericementitis arising from calcic deposits it is excellent. It is both escharotic and astringent, and it destroys abnormal surface tissue and purifies the same in a few moments after being applied.—H. C. McK., *Dental Brief*.

Arsenic Habit.—Some interesting experiments are recorded by W. Hausmann (*Deut. med. Wochtsft.*, December 31, 1903), who was able to immunize fowls and dogs against arsenic by treating them with repeated small doses. The degree of immunity was very slight, resembling that which is seen among the inhabitants of Steiermark in Europe, who are renowned as habitual arsenic eaters. These people, and also the experimental animals, are known to succumb when larger doses are given, and the amount tolerated is even less than that ingested by normal individuals who had never been accustomed to the drug. It was found that the arsenic was less toxic in the powder form than in solution.—*Medical News*.

Gold Inlays.—The subject of gold inlays has not received the attention it should have done, owing to the interest taken in porcelain work. A great many men in the first flush of enthusiasm are inclined to place porcelain inlays in nearly all accessible cavi-

ties. I believe a perfect inlay is as good or a better tooth-saver than a perfect filling. Strength should be considered when it does not conflict with the artistic point of view. I have practically abandoned the use of porcelain inlays in all posterior cavities excepting those in which the completed work would be conspicuous and in large buccal cavities liable to be affected by the thermal changes, and use gold inlays in all other cavities of this class that I do not fill with gold or plastics.—FRANK E. CHEESEMAN, *Dental Review*.

The Replacement of Crowns in Young Patients.—The problem as to how best to replace teeth which have been lost through what may properly be termed criminal negligence, or those which are missing as a result of non-eruption, or lack of tooth-germ development, is always and necessarily a serious one, for at least three reasons. First, because we must of necessity involve the possible integrity and longevity of adjacent—perhaps sound—teeth. Second, because the replacement is usually indicated at such an early period in the lifetime of the patient as to demand that a maximum degree of permanence be obtained from the method adopted. Third, because our efforts are confined to environments which present so great a diversity in range of conditions as to preclude the adoption of any one general line of procedure.—HART J. GOSLEE, *Pacific Dental Gazette*.

Chronic Poisoning by Antimony and Lead.—Dr. Leslie Roberts describes the case of a patient, a compositor by occupation, suffering from chronic poisoning by antimony and lead. The symptoms complained of were sweating, tenderness of the palms of the hands and soles of the feet, and pains in the muscles of the arms and back. The patient had been forced to give up work on account of the tenderness of the fingers. The palms were of a pinkish-red color and drenched with perspiration. Scattered all over the palms were small, flat, smooth papules. Microscopic examination of the skin showed the rete to be hypertrophied, the sweat-ducts to be much dilated, and the capillaries congested. The condition of the palms was not to be distinguished from that seen in some forms of arsenical poisoning. The linotype alloy was composed of tin, antimony, and lead. The patient's urine was free from albumin but contained lead, to which metal the tremors and muscular weakness might be attributed. He had not suffered from colic. The plumbism seemed to have been modified by the presence of antimony.—*Lancet*.

Combination Plates for the Lower Jaw.

—I have had patients come to me who have had plate after plate made for the lower jaw, and I myself have tried other plates for them without success; but when I have cast a metal plate, made rubber attachments to it and put it in the mouth, I have given absolute satisfaction to the patient, to myself, and to all concerned. I can name a number of them just in that condition. While there are some mouths in which if you put a weighted plate it would flop from one side to the other, those are the exceptions to the general rule. Very few patients can stand any pressure on the outer ridge, and if there is any pressure we must go over the other ridge too. The cheeks help to hold it, I think, and we can get over many difficulties in that way.—J. BOND LITIG, *Items of Interest*.

Caries Among the Coolies of Natal.—The sugar plantations in Natal are worked by coolie labor, the coolies being imported from India for the purpose. Each plantation has its coolie quarter—a little world in itself. It has also its own private hospital, and a medical man from the nearest village attends daily. The principal ailment these people suffer from is toothache. The young cane is very luscious; it is also very nourishing. The food the coolie lives on is not rich in health-sustaining ingredients; it consists principally of rice, oil, dholl, and ghee, so the people make up the deficiency by chewing cane continuously. The saccharin gets in its fine work, and the result is almost universal toothache. The ailment, in fact, is so common that if a man should plead it as an excuse for absenting himself from work, he would be put down at once as a "shirker."—D. S. RICARD, *Dental Record*.

Plastic Fillings.—Plastic fillings, whether of amalgam or oxyphosphates, must have surrounding walls to resist the pressure necessary in packing. If one or more of the walls are missing, they should be supplied by some form of matrix suitable to the case in hand. An "all-round" matrix is the best for badly broken-down teeth, and when amalgam is used let it remain until the following day, when it can be removed and the filling shaped and polished. The "all-round" matrix made of German silver Nos. 34 to 36 gage is most satisfactory. A number of rings can be kept on hand of size for molars and bicuspsids so as to avoid delay in soldering for each case which presents. The rigidity of German silver is sufficient, yet it can be readily bent to the proper contour and rigidly kept in posi-

tion by wedges or red base-plate gutta-percha. An entire amalgam crown can thus be made when the expense of gold must be considered.—*Western Dental Journal*.

Sealing Arsenical Applications into Cavities Difficult of Access or Extending Beyond Gum Margin, or Both.—Prepare the cavity margins as for permanent fillings. If gum hemorrhage ensue, pack with cotton saturated with adrenalin chlorid while preparing application and filling. When everything is ready, remove the cotton, syringe the cavity with warm water, lay in a piece of asbestos felt about large enough to cover the floor of the cavity; cover the cervical wall of the cavity with amalgam until the filling reaches beyond the gum margin; press the asbestos felt away from the floor of the cavity, and place the application in position in the space previously occupied by the felt. Press back the asbestos felt over the application, and fill the remainder of the cavity. When it is desirable to remove the pulp, drill down behind the filling, extending the cavity sufficiently to admit of direct access to the canals, or, if sufficient enamel wall exists between the filling and the point directly over the pulp-chamber to warrant it, open through the fissures without any regard to the filling. This method protects the gum from the action of arsenic, and simplifies the after-treatment.—R. E. SPARKS, *Dominion Dental Journal*.

Nitrous Oxid and Oxygen.—The use of nitrous oxid and oxygen for prolonged anesthesia is satisfactory, but limited. The wealthy class alone can demand it, because of the cost of materials and the larger fee for the engagement of an experienced anesthetist. The bulky and expensive apparatus and the difficult method of administration are not inviting, and the occasional lack of smoothness in the narcosis discomfits the surgeon. Hence the employment of this method will be reserved for anesthetists in the larger cities, in the case of operations upon the extremities or trunk where the condition of the patient demands an anesthesia free from danger and practically free from after-effects. The deservedly increasing popularity of the gas and ether combination predicts a similar popularity for the use of gas, oxygen, and ether when the gases are used until the incision is made and after the suturing is begun, and the ether provides complete relaxation and freedom from cyanosis during the operation proper. The contra-indications are chronic alcoholism, well-marked arterio-sclerosis, or cardiac lesions.—PRESCOTT LEBRETON, *New York Med. Journal*.

Impaction of a Plate in the Esophagus and its Removal by External Esophagotomy.

At the meeting of the Surgical Society of Paris, M. Tuffier read an account of a case under the care of M. Guibal in which a patient had swallowed a large tooth-plate during sleep. The foreign body, which gave rise to no subjective symptoms beyond a slight difficulty in swallowing, was located by means of a metallic esophageal sound at a distance of twenty-six centimeters (ten and a half inches) from the dental arches, almost on a level with the fifth cervical vertebra. The results of radioscopy were negative and radiography gave only a blurred picture. After a very cautious attempt at extraction by way of the natural passages with the aid of long curved forceps, M. Guibal immediately performed external esophagotomy. The tooth-plate, one of the hooks of which was fixed in the wall of the esophagus, was extracted without difficulty, the esophagus was sutured in two places, and drainage was provided for. Recovery took place without any incident beyond the formation of a minute esophageal fistula, which healed rapidly. M. Tuffier, commenting on the case, said that when foreign bodies of irregular outline were impacted in the esophagus it was wrong to make prolonged or energetic attempts to extract them by the natural passages, and that external esophagotomy ought to be performed without much delay.—*British Journ. of Dental Science*.

Immunization Against Pathogenic Organisms Prior to Surgical Operations.

Dr. Johann von Mikulicz-Radecki has carried out a large series of experiments on guinea-pigs and rabbits by which he has been able to show that these animals can be more or less completely immunized against peritoneal infection with virulent *Bac. coli communis* by causing a previous hyper-leucocytosis by sub-peritoneal or subcutaneous injection of nucleic acid. Normal saline injections doubled the resisting power of the peritoneum to a lethal dose of the organism, but nucleic acid was able to raise the power of resistance sixteen to twenty-fold. The author then proceeded to apply this method of immunizing in his surgical practice. He found a two per cent. solution of nucleic acid most suitable, and injected about 50 cc. subcutaneously a few hours before operation. He is of the opinion that about twelve hours' interval between injection and operation secures the most favorable conditions, as at this time the leucocytosis is on the rise. The injection is usually attended by a little local reaction and a slight rise of temperature. He has resorted to this pro-

phylactic method in forty-five abdominal operations, including resections of stomach for carcinoma, gastro-enterostomies, and nephrectomies, and has had seven deaths, none of which was due to peritonitis, and believes that the injections have had a distinctly favorable influence on the course of the cases.—*Internat. Journ. of Surgery*.

Formaldehyd.—Formaldehyd or formic aldehyd (methaldehyd) has the formula $\text{H}\cdot\text{CHO}$ or CH_2O . It occurs in the cells of plants containing chlorophyll and is said by Bayer to be the natural protector of these cells from bacteria. It is probably a transition stage in the conversion of atmospheric carbon dioxid—absorbed by the plant cells—into starches and sugars. It stands midway between methyl alcohol and formic acid. It is formed when calcium formate is subjected to dry distillation. It is usually prepared by passing a mixture of methyl alcohol vapor and air over red-hot spongy platinum, or copper spiral. To demonstrate the formation under somewhat similar conditions, heat a platinum spiral to redness and suspend it over a small quantity of methyl alcohol contained in a beaker; the spiral continues to glow and the resultant product is recognized by its characteristic smell. The strongest available aqueous solution of the gas is forty per cent., and is sold under the name of formalin. It has a penetrating, pungent, and irritating odor, and is neutral in reaction. It is a powerful reducing agent. Formic aldehyd occurs in three forms: gaseous (formaldehyd), aqueous solution (formalin), and in a polymerized form, a white powder which is known as paraform, and is produced on evaporating the solution. The ease with which this substance becomes polymerized is an interesting characteristic. On heating formalin with a weak alkali, a substance, or rather several substances, are formed, known as formose, belonging to the sugar group.—B. BENNETTE, *Dental Record*.

To Refit a Plate.—Take a large engine bur and roughen the under side by cutting away all the rubber that comes in contact with the gum tissue. Take a piece of modeling composition, soften it in warm water, and put it around the under surface of the plate. Insert it in the mouth, press it down, and let the patient close the jaws. See if the bite be correct and the teeth as high as you want them. If everything be as desired, instruct the patient to keep the teeth closed while you take your water syringe and chill the modeling composition with cold water. Re-

move the plate and hold it in cold water or under the hydrant until the composition is thoroughly chilled. Take a sharp knife and trim the composition down just as you want your plate when finished, or nearly so. Return it to the mouth and instruct the patient to bite. Look to see if the bite, length of teeth, and everything is as it should be; remove and invest in plaster, in the lower half of the flask, with the teeth downward. Bring the plaster up even with the edge or rim of the plate, put in your separating fluid or whatever you use—and by the way, you will find tissue paper as good as anything; pour the upper half of the flask. Separate after heating in hot water, pack rubber where the composition was, and vulcanize. This can be done in less than half the time it takes to make a new plate, and is just as good. I have done this a few times with an upper plate, but if there be any undercut it is hard to separate; where there is no undercut, however, it is an easy way to remedy an upper plate, after the plate gets loose from absorption of the alveolar process.—J. T. PHILLIPS, *Dental Hints*.

Nitrous Oxid for Minor Dental Operations.—Nitrous oxid, most frequently used in extracting, may also be employed to great advantage in any operation where pain and nervousness make a patient uncontrollable; excising teeth for crowns, pulp-extirpation, replanting, cutting forms in very sensitive teeth for filling, lancing in abscessed conditions, or any operation the performance of which requires not more than a minute of time. If you would succeed in any operation under nitrous oxid anesthesia, you must first ascertain just what work you have to do. Examine with a view of forming a diagram of the case in your mind, as it appears in the patient's mouth, and never proceed with the anesthetic until this is acquired. Without a perfect understanding of the case confusion will prevent accuracy, and will so much retard the speed of the work that the duration of anesthesia will have elapsed before the work is completed. You should not expect to operate skilfully under personal excitement, and coolness is possible only where there is perfect understanding. Select suitable instruments for the performance of the work, decide where it is best to begin, and place the instruments in position on the bracket table, so that you can reach them in their turn, as you have decided to use them. This will help to avoid unnecessary change of instruments, and consequent waste of time. Get an idea of the temperament and general con-

dition of your patient without arousing his suspicion of your anxiety, and while it is well to show interest in his safety, and some regard for his nervousness, I think it unwise to question him extensively or convey to him the idea that much depends upon the heart's action. What knowledge you gain is overbalanced by his increased nervousness. He fights you and the anesthetic at the first flutter of the heart, because the importance of this has been impressed upon him.—E. R. JACKSON, *Dental Register*.

Painless Excavation.—The smooth-running engine and handpiece (with emphasis on the *handpiece*), together with sharp burs (again, decided emphasis on *sharp*), guided by a delicate touch, is still the main reliance for painless excavation of carious matter. There are various medicaments of partial help, but not one that is always to be relied on. An investigation of the handpieces and burs used by the majority of operators convinces me that there lies the greatest source of pain. A handpiece needs regular attention to keep it running true, and a bur needs the angle of the cutting blades to be very precise in order to prevent jar and heat of an unnecessary amount. A fair knowledge of the principles of mechanics will demonstrate to you in a few minutes the two evils of untrue rotation and the wrong angle of cutting edge in tools. There is a chance in our calling for a very scientific and practical discovery along these lines by some ingenious and educated member.—A. J. FLANAGAN, *Dental Hints*.

[It is unquestionably true that the pain incident to the excavating of dentin can be materially lessened by the use of sharp instruments, but it is equally true that in many cases cutting instruments even of the keenest type will be of little avail in decreasing the amount of pain if the operation be carried out without the previous application of suitable obtundents. All dentists will agree that with sharp, well-kept instruments operations are performed with greater rapidity and accuracy and with less pain than with dull instruments, but to rely almost entirely on the quality of the instruments implies that dental therapeutics is materially deficient, at least in its bearing upon the condition under discussion. Such is not, however, the case; as with such agents as carbolic acid, silver nitrate, Robinson's remedy, cocain, sodium bicarbonate, the essential oils, etc., judiciously applied, much if not all of the pain caused by the cutting of the dental fibrillæ may be abolished. It has been the writer's experience that a large percentage

of failures in the treatment of sensitive dentin are due to the facts that, first, dressings are applied without previously desiccating the cavity, and second, that they are not allowed to remain *in situ* for a sufficient time to insure their absorption by the dentinal fibrillæ—a condition which may be hastened by making the application under pressure from unvulcanized rubber packed in the cavity and molded to its outlines by means of large-headed burnishers.—Ed.]

Use of Formalin for Septic Canals.—

Much has been written and much has been said at various times upon the treatment of septic roots. Everyone has his own particular line of treatment, and according as that treatment is successful or not he says that it is possible, or that it is not possible, to cure old-standing cases of chronic suppuration in root-canals. There are, I believe, at the present time several successful forms of treatment in use by various members of the profession, and carefully compiled statistics from men employing different methods would, when compared, be both interesting and instructive. Formalin is acquiring an ever-widening reputation for the treatment of septic conditions in relation to teeth, and I should like to say how universally successful I have found it. I have used forty per cent. formalin now for over two years, for both acute and chronic suppurative conditions of root-canals; other practitioners that I know have used the drug for a longer period, and always with the most satisfactory results. In cases of acute supuration following the death and decomposition of pulps, a single dressing left in for twelve hours will invariably stop all active discharge, and at the end of three or four days all putrefactive changes will have ceased. The method adopted consists simply in thoroughly cleaning the canal mechanically with bristles, syringing out all débris with some antiseptic fluid, as 1:40 carbolic, then lightly drying the canal with cotton-wool, and passing up successively three or four broaches, carrying wool dampened—not soaked—in forty per cent. formalin. A dressing of the drug is then sealed in with gutta-percha for twenty-four hours. The treatment of chronic cases is, of course, a more tedious process, but it is surprising how soon a discharge that has continued for months and even years, will cease, and the roots become sweet again under the influence of this drug. The great advantage which formalin possesses over other preparations is its penetrating power, and the fact that it gives off a strongly germicidal vapor, which

will reach places otherwise inaccessible. As to any bad effects following its use, I have never seen or heard of any, beyond occasional slight pain, which lasts from a few minutes to half an hour in a few cases. The only caution with regard to its use is that the amount introduced at one time on a broach must not be in sufficient quantity to run the risk of pumping it through the apex of the tooth, as in soft tissue it acts as a most violent irritant. A very small amount of care will prevent any chance of this happening.—STANLEY P. MUMMERY, *Brit. Dental Journal*.

[If the author means a forty per cent. solution of formalin, which is itself a forty per cent. solution of formaldehyd gas, we fear that his results are most exceptional. The common practice is to employ formalin in 1 to 2 per cent. solutions, and even with such comparatively weak preparations it often happens that the dressing soon sets up violent inflammation in the periapical region. It appals us to think what might happen with a solution twenty times stronger.—Ed.]

Factors Influencing the Coagulation of the Blood in the Living Organism.—

Boggs (*Deut. Arch. f. klin. Med.* No. 79, 1904) has investigated very thoroughly the influence of various substances in reducing the time of coagulation of the blood. In his first experiments with gelatin he obtained a marked influence on six guinea-pigs, the time occupied in coagulation dropping rapidly from a normal of six minutes to as low as one-half to one minute in twelve to twenty-four hours, and rising again to the normal in the course of several days. This result is unique, and he was never able to obtain it again, although he varied the experiments in every conceivable manner and used various breeds of guinea-pigs. In all instances the influence was negative, or so slight that it fell within the range of normal variation. He is inclined to explain the remarkable result by a racial peculiarity. With gum arabic the time was slightly reduced (from 5.5 and 5 min. to 3.5 min.), but the influence lasted only from fifteen to thirty minutes. With cow's milk the result in two instances was a marked negative influence (from 4.2 and 6 to 12 and 11.5 min.), after a short and slight positive phase (4 min.).

The serum of different animals injected into guinea-pigs gave various results. Serum from a goose produced marked reduction in the coagulation time (from 4.3 to 2 min.), while dog's serum gave partly positive, partly negative phases, the two often following one another in rapid succession. Anti-leucocytic

serum had no effect on the coagulation time in a dog. Extracts of various organs (thymus, liver) showed constantly a positive action.

From a clinical standpoint the results with the calcium salts were the most interesting. In some of his investigations he substituted calcium lactate for the chlorid, which has the same effect on the coagulation time, is tasteless, and is well borne. In his experiments on animals with calcium chlorid a reduction in the coagulation time never failed to occur, the effect lasting on an average from two to three hours. In a guinea-pig, for instance,

with a coagulation time of 5 min., 25 cc. of 1 per cent. soluble calcium chlorid was introduced intravenously at 6.30 P.M. At 6.48 P.M. the coagulation time was 1.5 min.; at 7, 1.5 min.; at 7.10, 2.5 min.; at 7.35, 2.5 min.; at 10.30 A.M., 6 min. The calcium salts given to human beings by mouth produced a distinct reduction in the coagulation time, this result being absent in only a single instance. Examples: From 5 min. to 3.2 min., from 7.7 to 5 min., from 6.7 min. to 3.7 min., from 9.7 min. to 6 min. In one instance of purpura there was a reduction of from 21 min. to 6 min.—*Amer. Journ. of the Med. Sciences.*

OBITUARY.

DR. JOHN WELLINGTON CLOUGH.

DIED, at his home in Liberty, Maine, from heart disease, Dr. JOHN WELLINGTON CLOUGH.

Dr. Clough was born in Montville, Me., March 11, 1840. He entered upon the study of dentistry some time previous to 1864, obtaining his professional education mainly under the guidance of Dr. Calvin Moore of Belfast, Me.

Dr. Clough was an ingenious, diligent, and conscientious dentist, and always took a deep interest in everything pertaining to his chosen profession. He was a good neighbor, a kind husband, an indulgent father, and he will be missed by a host of friends in professional and social circles. He was married in 1866 to Luella A. Worthing of Palermo, Me., who survives him, together with one daughter, Mrs. George R. Berry of Hamilton, N. Y.

DR. ALFRED C. COGSWELL.

DIED, July 10, 1904, at Wolfville, Nova Scotia, after a long illness, ALFRED C. COGSWELL, D.D.S.

Dr. Cogswell was born in Cornwallis, N. S., seventy years ago. He came to the United States, and after matriculating in the Philadelphia Dental College, was graduated from that institution in 1869. Immediately upon his graduation he removed to Halifax, in which city he practiced continuously until a few years ago, when he turned over to his son, Dr. A. W. Cogswell, the larger share

of his office work. He was engaged in business concerns and held positions of trust and responsibility in two of the most important companies of Halifax.

Dr. Cogswell was a regular and exemplary church attendant and was for many years an elder of the Presbyterian church of Halifax. He is survived by a widow and two children, A. Robie and Dr. A. Wellesley Cogswell.

MRS. SARAH JANE WHITE.

DIED, at Rye, N. Y., in her eightieth year, Mrs. SARAH JANE WHITE, widow of the late Dr. Samuel Stockton White.

Mrs. White was taken seriously ill July 27th, while on a visit to her daughter, Mrs. Jas. S. McCulloh, and passed away August 5th. She was born in Wilmington, Del., August 29, 1824, her maiden name being Carey. In 1846 she married Dr. Samuel S. White, founder of the business which after his death became The S. S. White Dental Manufacturing Company.

Mrs. White is survived by two sons, J. Clarence White and Samuel S. White, Jr., both of Philadelphia, and by two daughters, Mrs. Henry M. Warren of Devon, Pa., and Mrs. Jas. S. McCulloh of Rye, N. Y. Another daughter, Mrs. Granville B. Haines, died a few months ago.

The funeral services were held at her late residence, 1622 Arch street, Philadelphia, and the interment was made in the family lot in Woodlands Cemetery.

Fourth International Dental Congress.

St. Louis, Mo., August 29 to September 3, 1904.

COMMITTEE OF ORGANIZATION.

H. J. BURKHART, *Chairman*, Batavia, N. Y.
 E. C. KIRK, *Secretary*, Philadelphia, Pa.
 R. H. HOFHEINZ, J. W. DAVID,
 WM. CARR, WM. CRENSHAW,
 W. E. BOARDMAN, DON M. GALLIE,
 V. E. TURNER, G. V. I. BROWN,
 J. Y. CRAWFORD, A. H. PECK,
 M. F. FINLEY, J. D. PATTERSON,
 B. L. THORPE.

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer, 1420 Chestnut st., Philadelphia, Pa.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen, 1005 Sutter st., San Francisco, Cal.
- IV. Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

VI. Orthodontia. Chairman, E. H. Angle, 1023 N. Grand ave., St. Louis, Mo.

VII. Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.

VIII. Prosthesis. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.

IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy, Marshall Field Bldg., Chicago, Ill.

X. Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Committees.

Finance. Chairman, C. S. Butler, 680 Main st., Buffalo, N. Y.

Program. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Exhibits. Chairman, D. M. Gallie, 100 State st., Chicago, Ill.

Reception. Chairman, B. Holly Smith, 1007 Madison ave., Baltimore, Md.

Registration. Chairman, B. L. Thorpe, 3666 Olive st., St. Louis, Mo.

Printing and Publication. Chairman, W. E. Boardman, 184 Boylston st., Boston, Mass.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey, 524 Penn ave., Pittsburg, Pa.

Dental Legislation. Chairman, Wm. Carr, 35 West 46th st., New York, N. Y.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel, 527½ Church st., Nashville, Tenn.

Membership. Chairman, J. D. Patterson, Keith and Perry Bldg., Kansas City, Mo.

Educational Methods. Chairman, T. W. Brophy, Marshall Field Bldg., Chicago, Ill.

Oral Surgery. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

Prosthetic Dentistry. Chairman, C. R. Turner, 33d and Locust sts., Philadelphia, Pa.

Local Committee of Arrangements and Reception. Chairman, Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Essays. Chairman, Wilbur F. Litch, 1500 Locust st., Philadelphia, Pa.

History of Dentistry. Chairman, Wm. H. Trueman, 900 Spruce st., Philadelphia, Pa.

Nomenclature. Chairman, A. H. Thompson, 720 Kansas ave., Topeka, Kans.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally, 1018 14th st., N. W., Washington, D. C.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown, 175 Newbury st., Boston, Mass.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz, Chamber of Commerce, Rochester, N. Y.

Prize Essays. Chairman, James Truman, 4505 Chester ave., Philadelphia, Pa.

Oral Hygiene, Prophylaxis, Materia Medica and Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck, 92 State st., Chicago, Ill.

Operative Dentistry. Chairman, C. N. Johnson, Marshall Field Bldg., Chicago, Ill.

Resolutions. Chairman, J. Y. Crawford, Jackson Bldg., Nashville, Tenn.

Clinics. Chairman, J. P. Gray, 212 N. Spruce st., Nashville, Tenn. Assistant chairmen: *For the West*—J. P. Root, Deardorf Bldg., Kansas City, Mo. *For the East*—H. B. McFadden, 3507 Hamilton st., Philadelphia, Pa. *For the South*—T. P. Hinman, Inman Bldg., Atlanta, Ga.

Nominations. Chairman, A. H. Peck, 92 State st., Chicago, Ill. W. E. Boardman, 184 Boylston st., Boston, Mass. M. R. Windhorst, 3518 Morgan st., St. Louis, Mo. Wm. Conrad, 3666 Olive st., St. Louis, Mo.

Ad Interim. Chairman, G. V. I. Brown, 445 Milwaukee ave., Milwaukee, Wis.

The officers of the Congress, honorary presidents, president, active vice-presidents, secretary-general, assistant secretaries and a treasurer will be nominated by the Nominating Committee—composed of two members of the Committee of Organization and two members of the Federation (F. D. I.) Committee, in accordance with instructions from the Director of Congresses, Hon. Howard J. Rogers.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material

progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.
DAVID R. FRANCIS, *President of Exposition*.

Fourth International Dental Congress.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

J. A. LIBBEY, *Chairman*,
524 Penn Avenue, Pittsburg, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing membership as prescribed by the Committee on Mem-

bership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of dentistry*. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state chairman, whose indorsement is a certification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the committee earnestly appeals to each eligible practitioner in the United States who is interested in the success of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are as follows:

General Chairman.

J. A. LIBBEY, 524 Penn Ave., Pittsburg, Pa.

Vice-Chairman.

WM. CONRAD, 3666 Olive St., St. Louis, Mo.

State Chairmen.

Alabama. H. CLAY HASSELL, Tuscaloosa.

Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.

California. J. L. PEASE, Central Bank Bldg., Oakland.

Colorado. H. A. FYNN, 500 California Bldg., Denver.

Connecticut. HENRY McMANUS, 80 Pratt St., Hartford.

Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.

District of Columbia. W. N. COGAN, The Sherman, Washington.

Florida. W. G. MASON, Tampa.

Georgia. H. H. JOHNSON, Macon.

Hawaii. M. E. GROSSMAN, Box 744, Honolulu.

Idaho. J. B. BURNS, Payette.

Illinois. J. E. HINKINS, 131 E. 53d St., Chicago.

Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.

Iowa. W. R. CLACK, Clear Lake.

Kansas. G. A. ESTERLY, Lawrence.

Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.

Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.

Maine. H. A. KELLEY, 609 Congress St., Portland.

Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.

Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.

Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.

Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.

Mississippi. W. R. WRIGHT, Jackson.

Missouri. J. W. HULL, Altman Bldg., Kansas City.

Montana. G. E. LONGEWAY, Great Falls.

Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.

New Hampshire. E. C. BLAISDELL, Portsmouth.

New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.

New Mexico. E. J. ALGER, Albuquerque.

New York. B. C. NASH, 142 W. 78th St., New York City.

N. Carolina. C. L. ALEXANDER, Charlotte.

N. Dakota. ALBERT HALLENBURG, Fargo.

Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.

Oklahoma. T. P. BRINGHURST, Shawnee.

Oregon. S. J. BARBER, Macleay Bldg., Portland.

Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.

Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.

S. Carolina. J. T. CALVERT, Spartanburg.

S. Dakota. E. S. O'NEIL, Canton.

Tennessee. W. P. SIMS, Jackson Bldg., Nashville.

Texas. J. G. FIFE, Dallas.

Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.

Vermont. S. D. HODGE, Burlington.

Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.

Washington. G. W. STRYKER, Everett.

West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.

Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.

Wyoming. W. F. ROSEMAN, Sheridan.

For the Committee of Organization,
EDWARD C. KIRK, *Secretary*.

Fourth International Dental Congress.

REPORT OF THE COMMITTEE ON NOMINATIONS.

The Nominating Committee appointed by the Committee of Organization of the Fourth International Dental Congress presented the following nominations for officers of the Fourth International Dental Congress [the list as here given embracing corrections and acceptances to date of publication]:

"President"—H. J. Burkhart, Batavia, N. Y.

"Honorary Presidents"—James Truman, Philadelphia, Pa. A. H. Fuller, St. Louis, Mo. G. V. Black, Chicago, Ill. Thomas Fillebrown, Boston, Mass. S. G. Perry, New York, N. Y. Gordon White, Nashville, Tenn. E. T. Darby, Philadelphia, Pa. James McManus, Hartford, Conn. G. A. Bowman, St. Louis, Mo. H. A. Smith, Cincinnati, O. T. W. Brophy, Chicago, Ill. Wm. Jarvie, Brooklyn, N. Y. Wm. Conrad, St. Louis,

Mo. M. R. Windhorst, St. Louis, Mo. S. H. Guilford, Philadelphia, Pa. J. D. Patterson, Kansas City, Mo. C. C. Chittenden, Madison, Wis. Wm. Carr, New York, N. Y. E. H. Smith, Boston, Mass. M. H. Cryer, Philadelphia, Pa. E. A. Bogue, New York, N. Y. V. E. Turner, Raleigh, N. C. A. L. Northrop, New York, N. Y. S. A. Freeman, Buffalo, N. Y. J. W. David, Corsicana, Texas. J. Hall Moore, Richmond, Va. C. Newlin Peirce, Philadelphia, Pa. B. Holly Smith, Baltimore, Md. H. E. Beach, Clarksville, Tenn. D. O. M. LeCron, St. Louis, Mo.

"Hon. Presidents from Foreign Countries (as far as appointed)"—France: Ch. Godon, Paris. England: Walter Harrison, Brighton. Spain: Florestan Aguilar, Madrid. Italy: V. Guerini, Naples. Holland: Jno. E. Grevers, Amsterdam. Switzerland: L. C. Bryan, Basle. Australia: Alfred Burne, Sydney. Germany: W. D. Miller, Berlin. Denmark: V. Haderup, Copenhagen. Canada: J. B. Willmott, Toronto.

"Vice-Presidents"—A. H. Thompson, Topeka, Kans. J. G. Reid, Chicago, Ill. George Fields, Detroit, Mich. Garrett Newkirk, Los Angeles, Cal. R. Ottolengui, New York, N. Y. R. M. Sanger, East Orange, N. J. D. N. Rust, Washington, D. C. N. S. Hoff, Ann Arbor, Mich. L. P. Bethel, Columbus, O. Jules J. Sarrazin, New Orleans, La. Chas. L. Alexander, Charlotte, N. C. C. H. Darby, St. Joseph, Mo. B. C. Nash, New York, N. Y. G. S. Vann, Gadsden, Ala. B. F. Luckey, Paterson, N. J. E. R. Warner, Denver, Colo. Wms. Donnally, Washington, D. C. Frank Holland, Atlanta, Ga. W. P. Dickinson, Minneapolis, Minn. E. K. Wedelstaedt, St. Paul, Minn. Adam Flickinger, St. Louis, Mo. V. H. Jackson, New York, N. Y. J. M. Whitney, Honolulu, Hawaii. Louis Ottofy, Manila, P. I. Cyrus M. Gingrich, Baltimore, Md. H. B. Tileston, Louisville, Ky. J. F. Dowsley, Boston, Mass. George E. Hunt, Indianapolis, Ind. M. S. Merchant, Giddings, Tex. M. L. Rhein, New York, N. Y. G. S. Shattuck, Detroit, Mich. W. L. Reed, Mexico, Mo. S. Leslie LeCron, Baltimore, Md. S. T. Bassett, St. Louis, Mo. W. A. Coston, Ft. Scott, Kans. F. L. Platt, San Francisco, Cal. H. F. Hoffman, Denver, Colo. Geo. Miller, Des Moines, Iowa. C. B. Reed, Topeka, Kans. H. T. King, Fremont, Neb. Richd. Cochran, Burlington, Iowa. H. C. Thompson, Washington, D. C.

"Honorary Vice-Presidents from Foreign Countries (as far as appointed)"—England: Wm. H. Williamson, Aberdeen. France: E. Sauvez, Paris. Spain: J. D. Losada, Madrid. Switzerland: Paul Guye, Geneva.

"Secretary-General"—Edward C. Kirk, Philadelphia, Pa.

"Treasurer—M. F. Finley, Washington, D. C.

"Committee to Nominate Honorary Presidents and Vice-Presidents for Foreign Countries—Edward C. Kirk, Philadelphia, Pa. Edward H. Angle, St. Louis, Mo. Wilbur F. Litch, Philadelphia, Pa."

Representatives of National Governments.

The representatives of national governments already appointed are as follows:

Austria—Otto Zsigmondy.

France—Ch. Godon, E. Sauvez.

Holland—John E. Grevers.

Nicaragua—Leopoldo Ramirez Mairena, Benjamin Vidaurre.

Spain—Jaime D. Losada.

Delegates of the Spanish Department of Public Education—Florestan Aguilar, Jaime D. Losada, Luis Subirana.

MEETING OF THE COMMITTEE OF ORGANIZATION

Held July 16th, at St. Louis.

A MEETING of the Committee of Organization was held at St. Louis on July 16th, at which the following communication from Mr. Howard J. Rogers, Director of Congresses of the Universal Exposition, St. Louis, 1904, was received:

ST. LOUIS, July 15, 1904.

DR. H. J. BURKHART, *Chairman Committee of Organization, Fourth International Dental Congress, Batavia, N. Y.*

Dear Sir,—In reference to the organization of the Fourth International Dental Congress, I request that you convey to the Committee of Organization the instructions of the Director of Congresses and of the Committee on Congresses to proceed forthwith with the permanent organization of the Fourth International Dental Congress. The reasons which have led the Exposition to take this step are briefly as follows:

The precedents established by the Second International Dental Congress in Chicago in 1893, and the Third International Dental Congress in Paris in 1900, wherein the Committee of Organization named the permanent officers;

Second, it has come to our attention in many ways that there seemed to be two factions interested in the Congress, one indorsing the action of the Committee of Organization, the other opposed to it. While legitimate rivalry is in no way to be discouraged, this opposition, from the best of our information, is based almost entirely upon personal motives, and as such cannot demand recogni-

tion on the part of the Exposition. It has also come to our notice that the methods of certain persons opposed to the Organization Committee, include the sending out of anonymous circulars and appeals to personal likes and dislikes. This does not commend itself to our sense of fair play.

We have received many communications representing the great body of neutral dentists who have absolutely no interest one way or the other in the dispute in question, and no sympathy with either faction but a great interest in the success of the Dental Congress, asking that steps be taken to preclude any further contest. And we are further of the opinion, based on many sources of information, that a contest of the nature into which this has developed will influence many prominent dentists in all parts of the country to have nothing whatever to do with the Congress.

We find also that the prevailing state of uncertainty in regard to the permanent organization of the Congress is detrimental to the preparation of the program, as the speakers and chairmen are reluctant to spend time and money upon the preparation of papers and upon traveling and other expenses, when there is even a remote contingency that their work may not be ratified by those finally in charge of the Congress.

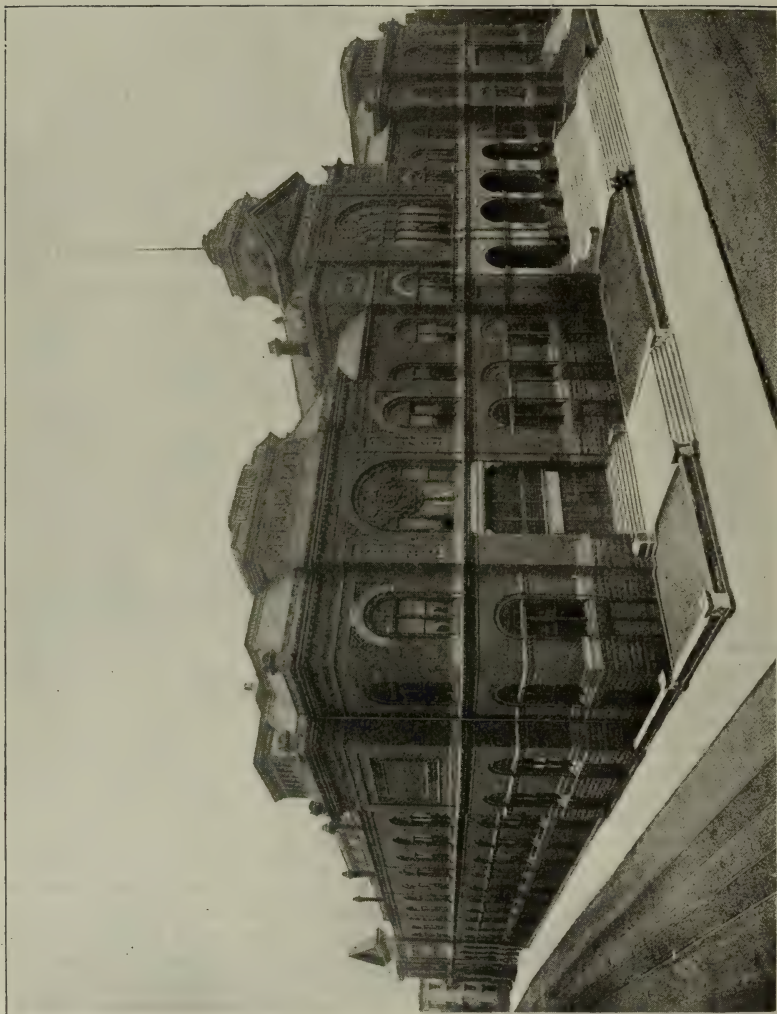
We wish it distinctly understood that so far as the Exposition is concerned the matter of what officials control the Congress is of no consequence whatever. The measures, however, which will bring the highest degree of success to the Congress are of paramount importance.

After thoroughly considering the subject we are unanimously of the opinion that the best interests of the Congress will be promoted by empowering the Committee of Organization to select the permanent officers, so that stability and certainty may be given to the plans and obligations governing the Congress. We see no other way to secure this necessary condition of affairs than by instructing your Committee, who are the duly authorized representatives of the Exposition and whose actions have been in every case regular, to take such steps as will carry out the authorization contained in the first paragraph of this communication.

Yours respectfully,

HOWARD J. ROGERS.

In pursuance of the foregoing instructions the Committee of Organization elected Dr. H. J. Burkhart as president and Dr. Mark J. Finley as treasurer of the Fourth International Dental Congress.



The Coliseum Building, St. Louis,

THE MEETING-PLACE OF THE FOURTH INTERNATIONAL DENTAL CONGRESS.

Program

OF THE

FOURTH INTERNATIONAL DENTAL CONGRESS,

AT

St. Louis, Mo., August 29 to September 3, 1904.

Department A — SCIENCE.

SECTION I.—ANATOMY, PHYSIOLOGY, HISTOLOGY, AND MICROSCOPY. (*Chairman*—Dr. M. H. CRYER, 1420 Chestnut st., Philadelphia, Pa.)

Chairman's address.

Florestan Aguilar, Madrid, Spain. "General Anesthesia by Somnoform."

G. G. Campion, Manchester, Eng. "Determining the Actual Path and Extent of Movement of the Mandible Condyle in the Living Subject."

D. E. N. Caush, Brighton, Eng. "Is There Uncalcified Tissue in the Enamel?"

M. H. Cryer. "Use of the Roentgen Rays in the Study of the Internal Anatomy of the Face."

W. T. Eckley, Chicago, Ill. "Phylogenetic Evidence Regarding the Function of the Accessory Sinuses in Man."

John E. Grevers, Amsterdam, Holland. "Anatomy of the Facial Skull—Normal and in Mouth-breathers."

—— "Geometrical Construction of the Mandible."

—— "Behavior of the Teeth Under Polarized Light."

A. Hopewell-Smith, London, Eng. "Some Anomalies of the Hard Dental Tissues."

Eugene S. Talbot, Chicago, Ill. "Anatomic Changes in the Head, Face, Jaws, and Teeth in the Evolution of Man."

A. H. Thompson, Topeka, Kans. "Ethnographic Odontography: The Mound-builders and the Pre-Indian Peoples of the Mississippi Valley."

J. G. Turner, London, Eng. (Subject to be announced.)

Arthur S. Underwood, London, Eng. (Subject to be announced.)

O. Walkhoff, Munich, Ger. "Concerning the Crania of Diluvial Peoples." (Illustrated with lantern slides.)

SECTION II.—ETIOLOGY, PATHOLOGY, AND BACTERIOLOGY. (*Chairman*—Dr. R. H. HOFHEINZ, Chamber of Commerce, Rochester, N. Y.)

Chairman's address.

C. F. W. Boedecker, Berlin, Ger. "Percussion in Dental Diagnosis."

G. W. Cook, Chicago, Ill. "The Effects of Chemical Agents on Bacteria with Relation to the Saliva."

T. Fugishima, Tokio, Japan. "A Case of Odontome."

Zahnarzt Hermann Rauhe, Düsseldorf, Ger. "Zur Aetiologie und Therapie der Kalksalz-amut."

Zahnarzt Dr. Hoffendahl, Berlin, Ger. "Die Anwendung des Konstanten galvanischen Stromes bei Behandlung pathologischer Zustände an den Zähnen."

Samuel A. Hopkins, Boston, Mass. "Application of the Results of Research Work to Daily Practice."

W. H. G. Logan, Chicago, Ill. "A Consideration of Some of the Etiological Factors that Produce Tissue Changes of the Alveolar Process and Overlying Soft Parts."

Jos. P. Michaels, Paris, France. "Sialogy: Differential Analyses; Elements of Value in Medical Diagnosis."

W. D. Miller, Berlin, Ger. "Researches Relating to Various Pathological Processes in the Teeth."

Louis Ottofy, Manila, P. I. "Observations on the Causes of Erosion: (a) Erosio Areca (betel erosion); (b) Erosio Orientalis."

M. L. Rhein, New York, N. Y. (Subject to be announced.)

Oskar Römer, Strasburg, Ger. "Some Pathohistological Observations on Pyorrhea Alveolaris."

D. D. Smith, Philadelphia, Pa. "Pericemental Abscess."

Eugene S. Talbot, Chicago, Ill. "Constitutional Causes of Tooth-Decay."

F. Vicentini, Chieti, Italy. "Leptothrix Racemosa."

SECTION III.—CHEMISTRY AND METALLURGY. (*Chairman*—Dr. J. D. HODGEN, 1005 Sutter st., San Francisco, Cal.)

Chairman's address.

J. P. Buckley, Chicago, Ill. "Chemistry of Pulp-Decomposition."

H. C. Carel, Minneapolis, Minn. (Subject to be announced.)

J. D. Hodgen, San Francisco, Cal. "Chemistry and Dentistry."

Hof-Zahnarzt W. Pfaff, Dresden, Ger. "Das Aluminium und seine Anwendbarkeit in Allgemeinen."

Seki-ichi Enomoto, Tokio, Japan. "Annealing Gold."

R. W. Simon, Boston, Mass. (Subject to be announced.)

Herbert L. Wheeler, New York, N. Y. "The Chemistry of Porcelain."

Weston A. Price, Cleveland, Ohio. "Technique of the Application of the X Ray in the Treatment of Pyorrhea Alveolaris."

E. Sauvez, Paris, France. "Study of the Various Means of Inducing Local Anesthesia for Extraction of the Teeth."

Zahnarzt Dr. Schaeffer-Stuckert, Frankfurt-on-Main, Ger. "Paranephrein Ritsert, ein neues Nebennieren-präparat in Verbindung mit Lokal Anästheticis in der Zahnheilkunde."

Edward Schlunkmann, Baltimore, Md. "Electric Absorption in Therapy."

C. R. Taylor, Streator, Ill. (Subject to be announced.)

SECTION IV.—ORAL HYGIENE, PROPHYLAXIS, MATERIA MEDICA AND THERAPEUTICS, AND ELECTRO-THERAPEUTICS. (*Chairman*—Dr. A. H. PECK, 92 State st., Chicago, Ill.)

Chairman's address.

H. L. Ambler, Cleveland, Ohio. "Care of the Teeth of the Poor."

Samuel Taylor Bassett, St. Louis, Mo. "Application of Electro-Therapeutics to Dental Surgery."

L. P. Bethel, Columbus, Ohio. "Some Results from Dental and Oral Prophylaxis."

Julio Endelman, Philadelphia, Pa. "Contribution to the Therapeutics of Post-Extraction Accidents."

Thomas Fillebrown, Boston, Mass. "Report of Committee on the Care of the Teeth of the Poor."

Richard Grady, Annapolis, Md. "Oral Hygiene: Mastication."

J. E. Hinkins, Chicago, Ill. "The Solvent Effect of Saliva on Cements."

Edward Hoffmeister, Baltimore, Md. "Materia Medica."

Prof. Dr. Jessen, Strasburg; Dr. Loos, Vienna; and Zahnarzt Georg Schlaeger. I. "Zahn-hygiene in Schule und Heer." II. Eine Wandtafel für den Ausschauungsunterricht in der Schule in Farben, "Gesunde und Kranke Zähne." III. Eine Wandtafel, ii. Auflage auch farbig, "Die Zähne und ihre Pfläge."

Louis Ottofy, Manila, P. I. "Oil of Ylang-ylang as a Dental Remedy."

— "Examination and Tabulation of the Condition of the Teeth of Public School Children."

Department B — APPLIED SCIENCE.

SECTION V.—ORAL SURGERY. (*Chairman*—Dr. G. V. I. BROWN, 445 Milwaukee st., Milwaukee, Wis.)

Chairman's address: G. V. I. Brown, Milwaukee, Wis. "Oral Surgery: Its Relations to General Surgery and Dentistry."

T. W. Brophy, Chicago, Ill. "Necessity for Early Operation for Cleft Palate."

M. H. Cryer, Philadelphia, Pa. "Some Points in Regard to Ankylosis of the Temporo-Mandibular Articulation."

T. L. Gilmer, Chicago, Ill. "The Teaching of Oral Surgery in Our Dental Schools."

H. H. Grant, Louisville, Ky. "Solid Tumors Involving the Body or Ramus of the Inferior Maxillary Bone."

J. G. Kiernan, Chicago, Ill. "Embryogenetic, Congenital, and Acquired Stomatoneurologic Relations."

A. H. Levings, Milwaukee, Wis. "Importance and Methods of Early Diagnosis of Malignant Growths Affecting the Maxillary Bone."

J. S. Marshall, San Francisco, Cal. "Fractures of the Mandible and Their Treatment."

Hof-Zahnarzt W. Pfaff, Dresden, Ger. "Verengerung der Nasenhöhle bedingt durch die Gaumenenge und anormale Zahnstellung. Die Heilung durch Dehnung des Oberkiefers. Die neuesten Forschungen von Zahnarzt Gustav Schroeder, Cassel, Deutschland."

A. Pont, Lyons, France. "L'Anesthésie locale et l'Analgésie générale au Chlorure d'Éthyle."

E. S. Talbot, Chicago, Ill. "Etiology of Cleft Palate and Hare-lip."

SECTION VI.—ORTHODONTIA. (*Chairman*—Dr. EDWARD H. ANGLE, 1023 N. Grand ave., St. Louis, Mo.)

Chairman's address.

Edward H. Angle, St. Louis, Mo. "Malocclusion: Class II and Its Divisions."

G. V. I. Brown, Milwaukee, Wis. (Subject to be announced.)

L. C. Bryan, Basle, Switzerland. "Nature as a Regulator, and Our Duty as Her Assistants."

Calvin S. Case, Chicago, Ill. "Principles and Methods of Retention in Orthodontia."

M. Chiwaki, Tokio, Japan. (Subject to be announced.)

Wm. Slocum Davenport, Paris, France. "Contribution to the Treatment of Short Bite and Jump Bite Cases."

Robert Dunn, San Francisco, Cal. "Mesial Position of the First Molars in Class I."

John E. Grevers, Amsterdam, Holland. "Proposal for an International Nomenclature for the Various Forms of Malocclusion."

Chas. A. Hawley, Columbus, Ohio. "Method of Determining the Normal Arch, and its Application in Orthodontia."

Alfred Korbitz, Charlottenburg, Ger. "Orthodontia in Germany."

Francisque Martin, Lyons, France. "The Correction of Deformities in Nasal Fractures."

R. Ottolengui, New York, N. Y. "Spreading the Maxillæ *versus* Spreading the Arch."

Hof-Zahnarzt W. Pfaff, Dresden, Ger. "Ueber die Entwicklung der diagnostischen und therapeutischen Methoden der Orthodontie und die Bedeutung der Aetiology der Irregularitäten für die Behandlung."

W. Booth Pearsall, Dublin, Ireland. "Irish Types of Malocclusion."

Herbert A. Pullen, Buffalo, N. Y. (Subject to be announced.)

Jose J. Rojo, Mexico City, Mex. "Study of the Etiology of Anomalies in Human Teeth."

Dr. Schroeder, Greifswald, Ger. "Prognathous Forms and Their Orthopedic Treatment."

A. Hopewell-Smith, London, Eng. (Subject to be announced.)

J. Sim Wallace, London, Eng. "Nasal Obstructions and Mouth-breathing, with Special Reference to Malocclusion of the Teeth."

Edmund Wuerpel, St. Louis. "Art."

Franz Zeliska, Vienna, Austria. (Subject to be announced.)

SECTION VII.—OPERATIVE DENTISTRY. (*Chairman*—Dr. C. N. JOHNSON, Marshall Field Bldg., Chicago, Ill.)

Chairman's address.

E. A. Bogue, New York, N. Y. "Operative Dentistry."

Jaime D. Losada, Madrid, Spain. "Preparation des Cavites et Inconvenients de l'Extension for Prevention."

Jas. M. Magee, St. Johns, N. B. "The Instrumentation and Filling of Crooked Root-Canals." (Illustrated.)

Sylvester Moyer, Galt, Ont. "The Enamel and Its Consideration in Cavity Preparation."

Garrett Newkirk, Los Angeles, Cal. "The Whole Question of Matrices and Their Uses."

Frank L. Platt, San Francisco, Cal. (Subject to be announced.)

Geo. C. Poundstone, Chicago, Ill. "The Cement Problem in Inlay Work."

M. L. Rhein, New York, N. Y. (Subject to be announced.)

Arthur Scheuer, Teplitz, Austria. "Tin-Cement and Sponge Tin: Two New Filling Materials and Their Use in Dentistry."

E. K. Wedelstaedt, St. Paul, Minn. "Gold-and-Tin."

Herbert L. Wheeler, New York, N. Y. (Subject to be announced.)

SECTION VIII.—PROSTHESIS. (*Chairman*—Dr. C. R. TURNER, 33d and Locust sts., Philadelphia, Pa.)

Chairman's address.

L. W. Baker, Boston, Mass. (Subject to be announced.)

George Brunton, Leeds, Eng. (Subject to be announced.)

Reuben C. Brophy, Chicago, Ill. "Rationale of the Use of Materials for Base-plates in the Construction of Artificial Dentures."

Calvin S. Case, Chicago, Ill. "The Mechanical Treatment of Cleft Palate."

Edw. G. Christiansen, Drammen, Norway. "Which is the Ideal Crown—the Banded Crown or the Crown Without Band?"

B. J. Cigrand, Chicago, Ill. "Facial Guide Lines as Taught by Artists."

Bernard Frank, Amsterdam, Holland. "A New Articulator on Anatomical Principles."

Hart J. Goslee, Chicago, Ill. "Porcelain Crowns."

F. H. Mamlock, Berlin, Ger. "(a) Ueber Porzellanstiftzähne. (b) Ueber Magnalium Prothesen und ihre Herstellung nach Dr. Eug. Müllerschen Gummidrucksystem."

Francisque Martin, Lyons, France. "Immediate Prosthesis after the Method of Dr. Claude Martin."

Joseph Nolin, Montreal, Can. "The Decline of Estheticism in Prosthesis."

B. Platschick, Paris, France. "Les dents à tube et leurs nouvelles applications."

———"Contribution à l'étude de la confection des couronnes en porcelaine."

Jas. H. Prothero, Chicago, Ill. (Subject to be announced.)

Zahnarzt Hermann Rauhe, Düsseldorf, Ger. "Eine neue Sangvorrichtung."

Rudolph Weiser, Vienna, Austria. "Some Cases Illustrating the Present Development of Conservative Dentistry and Dental Prostheses."

E. Lloyd Williams, London, Eng. (Subject to be announced.)

Geo. H. Wilson, Cleveland, Ohio. (Subject to be announced.)

SECTION IX.—EDUCATION, NOMENCLATURE, LITERATURE, AND HISTORY.

(Chairman—Dr. TRUMAN W. BROPHY, Marshall Field Bldg., Chicago, Ill.)

Chairman's address.

M. Chiwaki, Tokio, Japan. "Dentistry in Japan."

Ch. Godon, Paris, France. "Educational Standards of Europe."

S. H. Guilford, Philadelphia, Pa. "Nomenclature."

A. W. Harlan, New York, N. Y. "Dental Literature."

H. O. Heidé, Christiania, Norway. "The Training of Dentists in Norway."

A. O. Hunt, Omaha, Neb. "The Count System of Students' Credits."

Chas. McManus, Hartford, Conn. "International Character of the Early Development of Dentistry in America."

Louis Ottogy, Manila, P. I. (Subject to be announced.)

B. Platschick, Paris, France. "L'Œuvre de Pierre Fauchard dans la Prothèse dentaire."

Jose J. Rojo, City of Mexico, Mex. "His-

torical Annotations and Present Condition of Dental Education in the City of Mexico."

B. L. Thorpe, St. Louis, Mo. "History of American Dentistry."

Wm. H. Trueman, Philadelphia, Pa. "Report of Committee on the History of Dentistry."

James Truman, Philadelphia, Pa. "A Practical View of Education."

SECTION X.—LEGISLATION. (Chairman

—Dr. WM. CARR, 35 West 46th st., New York, N. Y.)

(Not received.)

THE CLINICS.

Porcelain.

C. C. Allen, Kansas City, Mo. *Table*. (Original method of making matrix for inlay with aid of gum camphor.)

W. V-B. Ames, Chicago, Ill. *Table*. (Porcelain restoration with silicate of zinc. Surface for adhesion of cements.)

Geo. T. Banzet, Chicago, Ill. *Chair*. (Porcelain restoration.)

E. H. Ball, Tama, Iowa, and C. W. Bruner, Toledo, Iowa. *Table*. (Demonstrating possibilities of porcelain in a country practice.)

J. Q. Byram, Indianapolis, Ind. *Table*. (A method of swaging matrices for inlays from center to margins.)

F. J. Capon, Toronto, Can. *Table*. (Porcelain bicuspid crowns.)

W. A. Capon, Philadelphia, Pa. (Porcelain tips and crowns.)

R. W. Carroll, Beaumont, Tex. (Porcelain-faced crown with half band, using platinum foil for cap.)

R. M. Chase, Bethel, Vt. *Table*. (Porcelain inlays by the impression and matrix system.)

F. E. Cheeseman, Chicago, Ill. *Chair*. (Large molar restoration, high-fusing porcelain; burnishing matrix directly to cavity.)

W. A. Coston, Ft. Scott, Kans. *Table*.

L. E. Custer, Dayton, Ohio. (Management of the inlay matrix.)

A. W. Dana, Burlington, Iowa. *Table*. (Cavity formation for porcelain inlay.)

S. F. Duncan, Joliet, Ill. *Table*.

W. L. Fickes, Pittsburg, Pa. (Cavity

formation and built-up inlays demonstrated by models.)

Adam Flickinger, St. Louis, Mo. *Chair*. (Method of removable porcelain bridges.)

W. H. Fordham, Scranton, Pa.

F. L. Fossum, New York, N. Y. (Construction of matrices for porcelain inlays with ivory instruments.)

V. H. Frederick, St. Louis, Mo. *Chair*. (Construction of porcelain crown, practical case.)

Edward Frumveller, Detroit, Mich. *Table*. (Porcelain jacket crown.)

H. J. Goslee, Chicago, Ill. *Table*.

Joseph Head, Philadelphia, Pa. *Chair*. (Porcelain inlay in approximal cavities of upper teeth.)

W. C. Herbert, Detroit, Mich. (The Spaulding method of restoring the entire natural enamel with porcelain.)

O. W. Hertig, Pittsburg, Pa. (Filling with matrix.)

J. C. Hertz, Easton, Pa. (Assembling and mounting the platinum and banded porcelain crown without instruments.)

J. F. Houston, Rio de Janeiro, Brazil. (Banded porcelain crowns.)

F. B. James, Wilton Junction, Iowa. *Table and chair*.

R. N. LeCron, St. Louis, Mo. *Chair*. (Porcelain bridge, setting with gutta-percha.)

——— *Table*. (Porcelain as applied to dental prosthesis.)

R. W. MacDonald, Erie, Pa. (Porcelain inlays, demonstrating a pyrometer furnace.)

W. P. Menzies, Dyersburg, Tenn. (Jenkins' porcelain inlay in deep cavities.)

L. A. Meyer, Oconomowoc, Wis. *Chair*. (Preparation of root and mounting Logan crown.)

J. E. Nyman, Chicago, Ill. *Table*.

W. T. Reeves, Chicago, Ill. *Chair and table*. (Porcelain restoration.)

F. E. Roach, Chicago, Ill. *Table*. (Something new in porcelain.)

F. W. Proseus, Rochester, N. Y. (A method of making an all-porcelain enamel crown, showing an easy and accurate way of procuring a perfect matrix entirely from models.)

J. J. Sarrazin, New Orleans, La. *Table*. (Retention of porcelain inlays; restorations including angles of incisors and approximal marginal ridges of bicuspid.)

H. M. Seamans, Columbus, Ohio. (Preparation of cavities with large models of porcelain inlay.)

W. H. Taggart, Chicago, Ill. *Table*. (New process for baking Jenkins' enamel. New principle in burnishing matrix. New nitrous oxid blowpipe.)

C. N. Thompson, Chicago, Ill. *Table*. (Cavity formation for porcelain inlay.)

C. M. Work, Ottumwa, Iowa. *Chair*. (Porcelain restoration; Mesio-occlusal cavity; central incisor.)

James O. Wells, Minneapolis, Minn. (Cavity preparation for porcelain restoration.)

Gold Inlays.

C. L. Alexander, Charlotte, N. C. *Table*. (Gold inlay work, hood abutments and cast fillings.)

F. T. Breene, Iowa City, Iowa. *Chair*. (Gold inlay platinum matrix.)

H. B. Harrell, Gainesville, Tex. *Table*.

J. M. Murphy, Temple, Tex. (Gold inlays in bicuspid, using platinum foil as a matrix.)

C. E. Parkhurst, Somerville, Mass. (Gold inlays, and uses of 1-1000 platinum.)

O. H. Simpson, Dodge City, Kans. *Table*. (Gold inlays and contours for broken-down and abraded teeth.)

C. N. Thompson, Chicago, Ill. *Table*. (Gold inlay: method of controlling warpage due to shrinkage of solder.)

H. B. Tileston, Louisville, Ky. *Table*. (Gold inlay, using impression and copper amalgam model.)

W. F. Whalen, Peoria, Ill. *Chair*. (Hollow gold inlay. Approximal and occlusal restoration.)

C. H. Wright, Chicago, Ill. *Chair and table*.

Surgery.

T. W. Brophy, Chicago, Ill.

T. L. Gilmer, Chicago, Ill.

D. F. Keefe, Providence, R. I. (Treatment of fractured jaws.)

G. D. Moyer, Montevideo, Minn. *Table*. (Some of the later appliances for treating fractures of the inferior maxilla.)

Gold Fillings.

G. M. Beemer, Mason City, Iowa. *Chair.*
 W. I. Brigham, South Framingham, Mass. *Chair.* (Burnished gold fillings in soft cement.)

E. C. Blaisdell, Portsmouth, N. H. *Chair.* (Non-cohesive gold.)

W. B. Conner, Akron, Ohio. *Table.* (The manipulation of Vernon's gold in contour work.)

J. W. Carmany, Mt. Carroll, Ill. *Chair.*

W. G. Crandall, Spencer, Iowa. *Chair.*

Edward Eggleston, Richmond, Va. *Chair.* (Demonstration of the possibilities of De Trey's gold as a filling.)

A. G. Fee, Superior, Wis. *Chair.* (Approximal gold filling in bicuspid, non-cohesive gold, gingival third, finishing with cohesive gold.)

J. W. S. Gallagher, Winona, Minn. *Chair.* (Combination cohesive and non-cohesive gold filling.)

T. M. Hampton, Helena, Mont. *Chair.* (Gold filling, mesial surface, superior central incisor.)

F. O. Hetrick, Ottawa, Kans. *Chair.* (Vernon's gold, finishing with gold and platina.)

B. C. Hinkley, Keokuk, Iowa. *Chair.* (Gold filling in incisors or bicuspids, using iridio-platinum for posts for retention.)

F. E. Howard, Buffalo, N. Y. *Chair.* (Lining cavities with gold to enhance color of tooth before filling with amalgam. Filling with amalgam and gold combined at one sitting.)

W. D. James, Tracy, Minn. *Chair.*

H. H. Johnson, Macon, Ga. *Chair.* (Anchorage posts of iridio-platinum for retaining large gold fillings.)

M. S. Merchant, Giddings, Tex. (Contour of front teeth with cohesive gold, starting with Sibley's felt gold, using hand and engine mallet without separators.)

J. G. Pfaff, St. Louis, Mo. *Chair.* (Compound platinum and gold filling with electric engine mallet.)

H. N. Richardson, Shenandoah, Iowa. *Chair.*

Arthur Scheuer, Teplitz, Austria. *Chair.* (The use of tin cement, or sponge tin in combination with gold filling.)

C. H. Seeger, Manitowoc, Wis. *Chair.* (Combination gold filling.)

W. S. Simmons, Dayton, Ga. (Hand mallet in contour work.)

W. M. Slack, Memphis, Tenn. (Use of Vernon's non-crystal gold.)

D. D. Smith, Philadelphia, Pa. (Filling front teeth without wedging.)

F. G. Van Stratum, Hurley, Wis. *Chair.*

J. W. Wiek, St. Louis, Mo. *Chair.* (Gold filling, hand mallet.)

(G. V. BLACK CLUB.)

S. Bond, Anoka, Minn. *Chair.* (Gold filling; approximal surface of an upper bicuspid or molar.)

C. M. Booth, Cedar Rapids, Iowa.

J. J. Booth, Marion, Iowa.

K. E. Carlson, St. Paul, Minn. *Chair.* (Gold filling; mesial surface of an upper central or lateral incisor.)

W. R. Clack, Clear Lake, Iowa. *Chair.* (Gold filling; disto-occlusal surface of an upper first or second bicuspid or molar.)

J. V. Conzett, Dubuque, Iowa. *Chair.* (Gold filling; disto-occlusal surface of an upper left first bicuspid.)

Wm. Finn, Cedar Rapids, Iowa. *Chair.* (Gold filling; mesio-occlusal surface of an upper first molar.)

Otto J. Fruth, St. Louis, Mo. *Table.* (Mechanical.)

A. M. Lewis, Austin, Minn. *Chair.* (Gold filling; disto-occlusal surface of an upper bicuspid.)

J. B. Pherrin, Central City, Iowa. *Chair.* (Gold filling; mesio- or disto-occlusal surface of an upper bicuspid or molar.)

G. A. Rawlings, Bismarck, N. D. *Chair.* (Gold filling; mesial or distal surface of an upper central incisor.)

A. J. Schlueter, Jr., Aberdeen, S. D. *Chair.* (Gold filling; mesio-incisal surface of an upper central incisor.)

A. C. Searle, Owatonna, Minn. *Chair.* (Gold filling; mesial surface of an upper first or second bicuspid.)

J. F. Wallace, Canton, Mo. *Chair.* (Amalgam filling; approximal surface of an upper or lower molar. Black's method of using matrix.)

E. K. Wedelstaedt, St. Paul, Minn. *Chair.* (Gold filling; mesio-occlusal surface of an upper first molar.)

R. B. Wilson, St. Paul, Minn. *Chair*. (Gold filling; mesio-occlusal surface of an upper first or second bicuspid.)

Crowns and Bridges.

J. R. Beach, Clarksville, Tenn. (Diatoric teeth in crown and bridge work.)

R. F. Berthel, St. Paul, Minn. *Table*. (New method of obtaining perfect articulation for shell crown.)

C. M. Bordner, Shendandoah, Pa. (A simple method of banding roots.)

J. E. Chace, Ocala, Fla. *Table*.

H. J. Combs, Niago, Ill. *Table*. (Novel method of using the Davis crown in bridge work.)

W. A. Coston, Ft. Scott, Kan. *Table*. (Construction of porcelain molar crowns without facings.)

S. Finley Duncan, Joliet, Ill. *Table*.

Adam Flickinger, St. Louis, Mo. *Chair and table*. (Original method of removable porcelain bridge.)

C. L. Frame, Columbus, Ohio. *Table*.

V. H. Frederick, St. Louis, Mo. *Chair*. (Construction of porcelain crown, superior central incisor.)

Otto J. Fruth, St. Louis, Mo. *Chair*. (Practical case of replantation with porcelain; restoration of crown and part of root.)

H. J. Goslee, Chicago, Ill. *Chair and table*.

F. A. Greene, Geneva, N. Y. *Table*. (Attaching facings in crown and bridge work without heating the porcelain.)

W. H. Hayden, Youngstown, Ohio. (A method of constructing dummies and Richmond crowns using the Whiteside crowns.)

J. G. Hildebrand, Waterloo, Iowa. *Table*. (Original method of contouring crowns.)

C. W. F. Holbrook, Newark, N. J.

J. G. Hollingsworth, Kansas City, Mo. *Table*. (New crown system.)

F. B. James, Wilton Junction, Iowa. *Table*. (Porcelain crown for a badly broken-down root.)

F. W. Ketner, Hudson, N. Y. *Table*. (Setting crowns by the use of the electric furnace.)

Russell Markwell, Galveston, Tex. *Table*. (Anterior bridge supported by gold inlays.)

A. R. Melendy, Knoxville, Tenn. *Table*. (Special attachments for small bridges.)

L. A. Meyer, Oconomowoc, Wis. *Chair*. (Preparation of root and mounting Logan crown.)

J. E. Nyman, Chicago, Ill. *Table*. (Special cases in crown and bridge work.)

F. A. Peeso, Philadelphia, Pa. *Table*. (Technic of fixed and removable crown and bridge work.)

J. B. Ridout, St. Paul, Minn. *Table*. (New method of backing facings for Richmond crowns; new method of making continuous gum plate; method of putting gold corner or filling in porcelain tooth.)

Chas. W. Rodgers, Boston, Mass. (A sectional bridge.)

R. M. Sanger, East Orange, N. J. (Sanger's method of crowning.)

G. W. Schwartz, Chicago, Ill. *Table*. (Porcelain crown and bridge work.)

H. A. Shannon, Lincoln, Neb. *Table*. (Esthetic crowns and dummies.)

R. L. Simpson, Fincastle, Va. *Table*. Hatbrim Richmond crown porcelain-faced bicuspid shell.)

A. C. Steurwald, St. Ansgar, Iowa. *Table*. (Casting solid gold cusps in cuttlebone. Obtaining correct occlusion.)

J. M. Thompson, Detroit, Mich. *Table and chair*. (Porcelain jacket crown.)

R. C. Tryanham, Hillsboro, Tex. (Diatoric teeth for use in crown and bridge work.)

S. H. Voyles, St. Louis, Mo. *Chair*. (Construction of shell crown without impression or model.)

— *Table*. (Saddle bridge; pinless teeth.)

J. E. Wait, Superior, Neb. *Table*. (Method of making bicuspid and molar crowns.)

C. M. Work, Ottumwa, Iowa. *Chair*. (Porcelain restoration; mesio-occlusal cavity; central incisor.)

Gold Crowns.

L. P. Dotterer, Charleston, S. C. *Table*. (Accurate method of making gold crowns where little grinding can be endured.)

J. G. Hollingsworth, Kansas City, Mo. *Table*.

C. N. Thompson, Chicago, Ill. *Table*.
(Hollow gold crown.)

C. M. Work, Ottumwa, Iowa. *Table*.
(Original method of making a gold crown.)

Artificial Dentures.

J. B. Beauman, Columbus, O. (Lower anchored dentures.)

H. F. Cassel, St. Louis, Mo. *Table*. (Striking up partial gold plate with swaged enforcement, using single thickness of gold.)

Everett M. Cook, Toledo, Ohio. (An attachment for holding partial dentures in the mouth.)

Adolph Gropper, Milwaukee, Wis. *Table*.
(Continuous gum work.)

L. P. Haskell, Chicago, Ill. *Table*. (Preparation for models and making of dies.)

T. W. Pritchett, Whitehall, Ill. *Table*.
(Bonwill method of articulating full dentures.)

S. L. Seeley, Waverly, Iowa. *Table*. (Refitting lower denture, without resetting teeth.)

F. W. Slabaugh, Omaha, Neb. *Table*. (A new method of packing vulcanite rubber.)

W. R. Smith, Pawnee City, Neb. *Table*.
(Use of vulcanizable gutta-percha in plate work.)

G. H. Wilson, Cleveland, Ohio. *Table*.
(Vulcanite.)

Orthodontia.

C. S. Case, Chicago, Ill. *Table*. (Fitting of bands and construction of retaining appliances.)

M. A. Knapp, St. Paul, Minn. *Table*.
(Practical orthodontia.)

V. H. Jackson, New York, N. Y. (Regulating system.)

J. E. Orrison, Baltimore, Md. (Skiagraphy in connection with irregular teeth.)

G. D. Sitherwood, Bloomington, Ill. *Table*.
(Soldering bands and fixtures; gold plating and adjusting them.)

Richard Summa, St. Louis, Mo. *Chair*.
(Practical application of the Angle fracture band.)

W. E. Walker, New Orleans, La. *Chair*.
(Orthodontia and impressions of the face in plaster of Paris and rice gluten.)

Obturator.

R. R. Johnson, Great Falls, Mont. *Table*.
R. Ottolengui, New York, N. Y. *Table*.
(Demonstration on the making of artificial vela and obturators.)

R. M. Seibel, Kansas City, Mo. *Table*.
(A modification of Suersen's principle for obturator; also simple method for taking impressions.)

Pyorrhea Alveolaris.

B. F. Arrington, Goldsboro, N. C. *Chair*.

E. C. Briggs, Boston, Mass. *Chair*.

A. W. Harlan, New York, N. Y. (Surgical treatment of pyorrhea alveolaris.)

W. H. G. Logan, Chicago, Ill. *Chair*.

O. H. Manhard, St. Louis, Mo. *Table*. (Appliance for retention of loose teeth, especially applicable in pyorrhea.)

R. G. Richter, Milwaukee, Wis. *Chair*.

R. L. Schmitt, Waxahachie, Tex. (X ray in the treatment of pyorrhea alveolaris.)

H. T. Stewart, Memphis, Tenn. *Chair*.
(Mechanical devices in the treatment of Riggs' disease.)

C. R. Taylor, Streator, Ill. *Chair*. (Rubber in the mechanical and chemical cleansing of all surfaces of the teeth in the treatment of pyorrhea alveolaris.)

Gordon White, Nashville, Tenn.

Extracting, etc.

J. W. Slonaker, Chicago, Ill. *Chair*. (Extraction with nitrous oxid.)

A. Brom Allen, Chicago, Ill. *Chair*. (Extraction, using nitrous oxid with Allen aseptic inhaler.)

——— *Table*. (Showing instruments for extractions and method of using. Models of impacted third molars, prepared by Dr. C. Edmund Kells, New Orleans, La.)

J. D. Combs, Philadelphia, Pa. *Chair*.
(Demonstration of nitrous oxid and air without the face-piece.)

E. Sauvez, Paris, France. (Local anesthetics for extractions and all operations of the mouth.)

J. D. Thomas, Philadelphia, Pa. (A demonstration of nitrous oxid and air without face-pieces.)

Miscellaneous.

J. W. Birkland, Chicago, Ill. *Chair*. (Amalgam filling with matrix; Black's cavity preparation.)

Alden Bush, Columbus, Ohio. (Anatomical models for teaching cavity preparation, dental anatomy, etc.)

C. S. Case, Chicago, Ill. *Chair*. (Plaster impression of large congenital cleft.)

Nelson D. Edmonds, Wilmington, Ohio. (A new and original method of constructing dental splints.)

L. C. Elkin, St. Augustine, Fla. (Method of tin-lined amalgam fillings and amalgam inlays.)

W. L. Ellerbeck, Salt Lake City, Utah. *Table*. (Electric furnace construction.)

Solomon Freeman, New York, N. Y. (The uses of compressed air in dental practice.)

C. H. Frink, Fernandina, Fla. *Table*. (Dental electro-physics.)

A. N. Gaylord, Philadelphia, Pa. *Chair*. (Removal of pulp from as nearly a normal tooth as it is possible to obtain.)

Gillette Hayden, Columbus, Ohio. *Chair*. (Treatment of diseased pulps.)

W. I. Jones, Nelsonville, Ohio. (Use of nitrous oxid in extirpation of pulp, and in treatment of pulpitis and alveolar abscess.)

Elgin MaWhinney, Chicago, Ill. *Table*. (New drugs and some old ones; with therapeutics and indications for uses.)

A. F. Merriman, Jr., Oakland, Cal. *Chair*. (Aqueous obtundent: (a) Excavating sensitive dentin; (b) General excavation.)

Joseph L. Pease, Oakland, Cal. (Plastic tin filling.)

A. Pont, Lyons, France. (Local anesthesia and general anesthesia combined with the use of ethyl chlorid.)

J. J. Rojo, Mexico City, Mex. *Table*. (Taking impressions.)

G. D. Sitherwood, Bloomington, Ill. (Soldering bands and fixtures; gold plating and adjusting.)

M. I. Schamberg, Philadelphia, Pa. *Chair*. (Diagnostic and therapeutic application of the X ray to dentistry and oral surgery.)

Emil Schreier, Vienna, Austria. (Device by which the engine is started, stopped, and reversed at the hand-piece.)

C. O. Simpson, St. Louis, Mo. *Table*. (Demonstrating strength and durability of amalgams and cements.)

W. R. Smith, Pawnee City, Neb. *Table*. (Prosthetic.)

E. R. Warner, Denver, Colo. *Table*. (Masticating force of human jaws, demonstrated by appliances.)

(Subject not given.)

N. A. Geyer, St. Petersburg, Russia.

C. M. Gingrich, Baltimore, Md.

C. F. W. Holbrook, Newark, N. J.

E. S. James, San Francisco, Cal.

M. C. Smith, Lee Hall, Lynn, Mass.

EXHIBITORS.

The following manufacturers and dealers have reserved space up to date:

The S. S. White Dental Manufacturing Co.
Claudius Ash & Sons, Ltd.

H. D. Justi & Son.

Kress & Owen Co. "Glyco-Thymoline."

J. W. Ivory. (Specialties.)

Oakland Chemical Co.

American Cabinet Co.

Ransom & Randolph Co.

Ammonol Co.

Jno. T. Nolde Dental Manufacturing Co.

Hisey Manufacturing Co.

E. De Trey & Sons.

Electro-Dental Manufacturing Co.

Johnson & Johnson.

Detroit Dental Manufacturing Co.

Harvard Co.

Lee S. Smith & Son.

Sanitol Chemical Laboratory Co.

Jno. T. Milliken Co.

S. Eldred Gilbert Dental Manufacturing Co.

Ritter Dental Manufacturing Co.

Young Dental Manufacturing Co.

McKesson & Robbins Chemical Co.

Dentists' Supply Co.

Pinches & Ely. (Specialties.)

Frink & Young.

W. V-B. Ames.

A. C. Clark & Co.

Horlick's Food Co.

Chas. H. Phillips Chemical Co.
 Whiteside Dental Manufacturing Co.
 Klewe & Co. (Jenkins porcelain.)
 R. C. Brophy.
 L. O. Green.
 L. D. Caulk.
 Dutro & Hewitt.
 Blair Dental Manufacturing Co.
 Peroxidant Chemical Co.
 Goldsmith Bros.
 Adrian Rutherford.

Note.—The United States Government will make an exhibit consisting of a complete dental outfit as furnished to the members of the Army Dental Corps.

At St. Louis.

ARCHÆOLOGICAL DENTAL COLLECTION.

MEMBERS of the Fourth International Dental Congress are hereby informed that the archæological collection prepared under the auspices of the Ecole Dentaire of Paris will be exhibited in Sections XIX and XX, in the Palace of Liberal Arts.

Any information relating to the history of the exhibit will be gladly furnished by Dr. E. Sauvez, delegate of the French Government to the Fourth International Congress.

At St. Louis.

FOURTH INTERNATIONAL DENTAL CONGRESS BANQUET.

THE banquet of the Fourth International Dental Congress will be held September 1, 1904, at 8 P.M., in the Coliseum, adjoining the Congress Hall.

The price per plate will be three dollars. It is requested that all who expect to attend send their names and money to Dr. A. H. Fuller, P. O. lock box 604, St. Louis, Mo., at once—and not later than August 20th. Arrangements to pay can be made with Dr. A. H. Fuller at the time of registration, provided notice be given before August 20th.

G. A. BOWMAN,
 A. H. FULLER,
 ADAM FLICKINGER,
Banquet Committee.

At St. Louis.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

BEFORE the present issue of the COSMOS reaches its readers, the Federation and its commissions will have concluded the meetings at St. Louis of which we published the program in our August issue, from which we here repeat merely the list of officers—that is, for the first F. D. I. period.

We also print as received from Dr. Harlan a set of proposed rules and regulations for the International Dental Federation.

OFFICERS F. D. I.—FIRST PERIOD.

Education. President: T. W. Brophy. Vice-presidents: E. C. Kirk, W. B. Paterson, and O. Zsigmondy. Secretaries: Maurice Roy and R. B. Weiser.

Hygiene and Public Dental Service. President: W. D. Miller. Vice-presidents: Geo. Cunningham, E. Förberg, N. S. Jenkins, and C. Röse. Secretaries: R. Heidé, E. Sauvez, and R. B. Weiser.

International Dental Press. President: E. Förberg. Vice-president: A. W. Harlan. Secretary: E. Papot.

Executive Council. President: Charles Godon. Vice-presidents: A. W. Harlan and W. D. Miller. Secretary: E. Sauvez. Treasurer: F. Aguilar. Members: Geo. Cunningham, E. Förberg, R. B. Weiser, J. E. Grevers, F. Heidé, O. Klingelhöfer.

Proposed Rules and Regulations for the International Dental Federation.

ART. I. The INTERNATIONAL DENTAL FEDERATION was organized by the national committees present at the Third International Dental Congress, Paris, 1900, which was created in conformity with Resolutions 11 and 12 passed by the general meeting on the closing day of the aforesaid Congress, August 14th.

ART. II. The object of the Federation is as follows:

(a) The acceptance or rejection of invitations made by various countries to hold a regular International Dental Congress, to fix the date and place where the congress will be held;

(b) To maintain and strengthen the ties that bind the National Societies each to the other;

(c) The organization of several International Commissions that it may deem necessary to create;

(d) In a general way, to supervise the organization of bodies that will contribute to the advancement of odontological science throughout the world.

ART. III. The International Dental Federation is constituted of—

(a) All the national committees gathered in Paris in 1900, or their successors;

(b) Associations or societies giving their adhesion to the International Dental Congress, accepting these rules, or sending their concurrence in them;

(c) Societies, or groups of societies, which by their acts will send their acquiescence in these Rules and Regulations and will be acceptable to the Executive Council.

ART. IV. National dental associations, or, in the absence of such, societies desiring to become identified with the F. D. I. should send their acceptance of the present Rules and Regulations. These applications will be acted upon by the Executive Council, who will constitute them members.

ART. V. The general meeting of the F. D. I. will take place at the opening of each International Dental Congress. It will be composed of delegates from national or other societies. Meetings may be called for extraordinary reasons by the Executive Council.

ART. VI. The Executive Council will admit as members of the Federation—

(1) Members regularly appointed by societies;

(2) Honorary members;

(3) Persons who have been members of international dental congresses, and who shall subscribe to these Rules and Regulations.

ART. VII. The program for these meetings will be fixed by the Executive Council. It will deal with matters emanating from national or other societies, or on questions proposed by the Council. Notices will be sent at least one month before these meetings to all societies, national or local.

ART. VIII. Voting is done by the regularly appointed delegates. Upon a demand of representatives of at least two national dental associations, a vote will be taken by the whole Federation.

ART. IX. The annual meetings of the Executive Council, and of the various Commissions, are governed by the preceding rules.

ART. X. The F. D. I. is composed of an Executive Council, as follows:

(1) Fifty original members, chosen by the Congress—that is to say, one member for each country, as a minimum, with a maximum of five members;

(2) In case of vacancy, by resignation, death, or other cause, the Council will ask the country represented to replace the missing member. The powers of the Council will expire upon the opening of each International Dental Congress.

ART. XI. The Council is governed by nine Officers, as follows:

(1) A president;

(2) Three vice-presidents;

(3) A secretary-general;

(4) Three secretaries;

(5) A treasurer.

The Officers of the Council belong to all Commissions by these rules, and will direct them until they are properly launched and organized.

ART. XII. The duty of the Executive Council is—

(a) To supervise the execution of the rules of the Federation;

(b) To fix the place and date of annual meetings, and of International Dental Congresses;

(c) To organize various International Commissions;

(d) To see to the carrying out of decisions made by the F. D. I.;

(e) To examine propositions and resolutions offered by national committees, associa-

tions, or other societies. The Council will keep all affiliated bodies informed of their work through the Bulletin of the Executive Council, which will be published in four languages.

ART. XIII. The Council has named already several special Commissions, as follows:

- (1) A Commission of Education;
- (2) A Commission of Hygiene and Public Dental Service;
- (3) A Commission on the International Dental Press;

And it will organize—

- (4) A Commission on Professional Jurisprudence, etc.

ART. XIV. The expenses of the F. D. I. are provided for by equal assessment on all societies having representatives. Any excess above the receipts will be turned over to the next International Dental Congress, and any deficit is to be paid by said Congress. The Council will give a detailed statement of receipts and expenditures to every Congress.

ART. XV. The sources of income of the F. D. I. are as follows:

- (1) Subscriptions, gifts from governments or municipalities, from national associations, and from individuals;
- (2) By dues from the members, to wit:
Members of the Executive Council (per year)\$10.00
Members of Commissions (per year) .. 5.00
Honorary members and all others (per year) 5.00
(3) Donations from Congresses.

ART. XVI. These Rules are operative during the period between regular Congresses. They are subject to revision by the succeeding Congress.

ART. XVII. *Authority Creating the F.D.I.:* Resolutions passed by the Third International Dental Congress (Paris, France), August 14, 1900:

"*Resolution XI.* There shall be organized an International Federation.

"*Resolution XII.* The national committees appointed to this Congress will continue to exist, and they constitute the International Dental Federation."

A. W. HARLAN, *Vice-president*,
1122 Broadway, New York.

At St. Louis.

NATIONAL DENTAL ASSOCIATION.

At some opportune time during the progress of the Congress, the N. D. A. will meet for the election of officers and the transaction of whatever business may properly come before the association. Some changes in the constitution and by-laws may be considered.

Time and place of meeting will be announced at a general session of the Congress.

A. H. PECK, *Rec. Sec'y.*

At St. Louis.

AMERICAN SOCIETY OF ORTHODONTISTS.

A SPECIAL meeting of the American Society of Orthodontists will be held in the rooms of the Orthodontia Section of the Fourth International Dental Congress in the Coliseum, St. Louis, at 10 A.M., August 29, 1904.

ANNA HOPKINS, *Sec'y.*

At St. Louis.

DELTA SIGMA DELTA FRATERNITY.

MEETING OF THE SUPREME CHAPTER.

THE twentieth annual meeting of the Supreme Chapter, Delta Sigma Delta Fraternity, will be held Wednesday, August 31, 1904, at St. Louis, Mo. George E. Hunt, 131 E. Ohio st., Indianapolis, is chairman of the Committee on Arrangements.

At St. Louis.

INTERSTATE DENTAL FRATERNITY.

THE Interstate Dental Fraternity will hold its annual meeting at St. Louis, on Tuesday, August 30, 1904. The business meeting will be at 3 P.M., to be followed by a banquet.

The committee in charge are Dr. Burton Lee Thorpe, chairman, Dr. Edward Everett Haverstick, and Dr. Ernest P. Dameron. Members may procure their banquet tickets in advance by remitting to Dr. E. E. Haverstick, 346 N. Boyle Avenue, St. Louis.

R. M. SANGER, *National Sec'y.*

SOCIETY NOTES AND ANNOUNCEMENTS.

CANADIAN DENTAL ASSOCIATION.

THERE will be a meeting of the Canadian Dental Association at Toronto, Ont., September 6, 7, and 8, 1904.

W. CECIL TROTTER, *Sec'y*, Toronto, Ont.

SOUTHWESTERN IOWA DENTAL SOCIETY.

THE Southwestern Iowa Dental Society will hold their eighth annual meeting at Osceola, Iowa, on October 11 and 12, 1904.

J. A. WEST, *Sec'y*, Creston, Iowa.

NORTHERN INDIANA DENTAL SOCIETY.

CHANGE OF DATE OF MEETING.

THE date of our next annual meeting, to be held at Huntington, Indiana, has been postponed to October 18 and 19, 1904.

A program of unusual interest has been completed, a synopsis of which will be announced in the next issue of this magazine. Don't forget to read it.

OTTO U. KING, *Sec'y*,
King Building, Huntington, Ind.

MISSISSIPPI DENTAL ASSOCIATION.

AT a meeting of the Mississippi Dental Association the following officers were elected: L. G. Nisbet, Aberdeen, president; W. H. Reaben, McComb City, first vice-president; J. E. Frazier, Canton, second vice-president; E. N. Bigham, Pontotoc, secretary; L. B.

McLaurin, Fayette, corresponding secretary; C. C. Crowder, Kosciusko, treasurer.

E. N. BIGHAM, *Sec'y*, Pontotoc, Miss.

WISCONSIN STATE DENTAL SOCIETY.

AT the thirty-fourth annual meeting of the Wisconsin State Dental Society held at Manitowoc, July 19 to 21, 1904, the following officers were elected for the ensuing year: H. T. Sackett, Fond du Lac, president; E. C. Oviatt, Columbus, first vice-president; P. B. Wright, Milwaukee, second vice-president; W. H. Mueller, Madison, secretary; Adolph Gropper, Milwaukee, treasurer.

The next meeting will be held at Oshkosh in July 1905.

W. H. MUELLER, *Sec'y*,
Madison, Wis.

SWEDISH DENTAL SOCIETY.

NOTICE OF PRIZE COMPETITION.

THE Swedish Dental Society announces the opening of a competition for the writing of a popular treatise, to be entitled "The Teeth and Their Care," intended for liberal distribution by the members of the society among persons of those classes in which hygienic care of the mouth is practically unknown. The treatise must be written in the Swedish language, and must not exceed one printed sheet. The competition is open to all members of the dental profession.

Each essay should bear a motto or mark, and should be accompanied by a sealed envelope containing on the outside the same motto or mark, but bearing no indication as to its

origin, and within containing the name and address of the author. The essay, preferably typewritten, should be forwarded, duly signed, not later than February 28, 1905, to the "Jury of the Swedish Dental Society," 19 Drottninggatan, Stockholm.

The committee appointed to pass on the merits of the essays that may be submitted will primarily consider whether they fulfill the purpose of a popular treatise on the teeth and their care intended for the instruction of the rising generation in the schools and the information of the lower classes of the people. The essay should embody a plain and easily assimilable statement of the subject, free from dry details and needlessly lengthy descriptions. Original illustrations or reproductions of any already published may be incorporated

to facilitate the understanding of the text. Authors should base their statements on strictly scientific facts, excluding hypotheses and doubtful theories.

The awards will be—First prize, 700 kroner (\$185); second prize, 300 kroner (\$80).

The jury appointed by the society consists of the following members: Profs. E. Almqvist and A. Lindström, with Prof. C. Wallis as alternate; also, Drs. V. Bensow, E. Förberg, and G. Forssman, with Dr. G. Modin as alternate.

The prize essays to become the property of the Swedish Dental Society.

On behalf of the Swedish Dental Society,

EMIL CHRISTENSON,
HARALD RAMBERG.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JULY 1904.

July 5.

No. 764,022, to HENRY E. WEBER. Dental cuspidor.

No. 764,189, to JAMES F. HARDY. Electric switch.

No. 764,528, to OLIVER C. HALDEMAN and JOHN R. HALDEMAN. Artificial denture.

July 12.

No. 764,871, to MANLEY A. SPARKS. Dental process.

No. 765,084, to SAMUEL E. KNOWLES. Dental matrix.

July 19.

No. 765,537, to FRANK P. ABBOTT. Dental duct appliance.

July 26.

No. 765,919, to CHARLES L. GIBBS. Dental impression cup.

No. 766,018, to HOUSTON M. CARROLL. Dental clamp.

THE DENTAL COSMOS.

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No. 10.

ORIGINAL COMMUNICATIONS.

THE RELATIONS OF MEDICINE AND DENTISTRY.

By EDWARD C. KIRK, D.D.S., Sc.D., Philadelphia, Pa.

(Read before the American Academy of Medicine, at Atlantic City, N. J., June 5, 1904.)

THE claim which dentistry makes for recognition as a department of the science and art of healing is one which probably needs no argument to support it. The fact that its objective ends are the cure of disease and the restoration of normal function are sufficient and self-evident foundations upon which to base the claim. Its peculiarities of origin and development have, however, caused dentistry to occupy an anomalous position with respect to those other allied departments of the art of healing to which collectively is applied the comprehensive term "medicine." In their origin both medicine and dentistry were probably coeval, for, among all the ills which flesh is heir to, primitive man doubtless suffered from dental diseases, and sought relief therefrom, as he did from his other infirmities, at the hands of those able to give it; it was in response to the demands for such relief that the healing art came into being.

DENTAL DISEASES TREATED BY THE EARLIEST PHYSICIANS.

The earliest records show that certain

classes of dental diseases were treated by physicians. The writings of Hippocrates, Galen, Scribonius Largus, Celsus, and their early followers contain descriptions of diseases of the teeth and directions for their treatment from a purely medico-therapeutic standpoint, showing that the treatment of dental diseases, including extraction of teeth, was a recognized part of the earliest medical practice.

Loss of the teeth or their partial destruction by caries necessitated a mode of treatment which practitioners of medicine were not prepared to supply. The kind of skill required in these restorative operations was that possessed by the artisan, and especially by the goldsmith and jeweler, hence it occurred that the making of prosthetic fixtures for the restoration of lost dental organs became engrafted upon the calling of the artisan or mechanic. Recent studies by Dr. Vincenzo Guerini of Naples, who has given much time to the subject of dental archæology, have brought to light the fact that prosthetic dentistry was practiced by Etruscan specialists in the art, who introduced it into Rome five or six

centuries before the Christian era and about four centuries before the advent of Archagathus, who according to Pliny was the first physician to practice in Rome.

It will thus be seen that dentistry has had a dual origin. Its problems in pathology have kept it in constant and vital relation with medicine, while its requirements in the restorative phase of its art have necessitated its relation with the craft of the artisan; and it is this latter feature, so essential to its practice, which has in the course of its evolution developed dentistry as a profession having a separate system of preparatory education, a special literature, and a professional organization independent of medicine.

ORIGIN OF THE DOCTORATE IN DENTISTRY.

The separate professional organization of dentistry became a necessity from the unwillingness of medical institutions to furnish the instruction necessary for the technical education of dental practitioners. The request was made and formally refused, with the result that in 1839 the first dental college in the world for the systematic training of dentists was established in Baltimore, and the divorcement of dentistry and medicine was then officially proclaimed.

The new enterprise did not escape opposition and criticism. Its graduates were authorized to call themselves doctors of dental surgery, and by many holders of the medical degree this assumption of the doctor title by the dental graduate was regarded as an invasion of medical rights, which brought down a storm of criticism upon the new profession. The institution was, however, supported by the general body of dentists, its classes increased, and the coincident founding of a well-ordered periodical devoted to the interests of dentistry, together with the organization of dental societies, soon established the profession of dentistry upon a sound continuing basis.

The evolution of all that concerns the science and art of healing during the sixty-five years which have intervened since the birth of the dental profession has

wrought some interesting changes in the relationships of medicine and dentistry as a result of the development which both have undergone.

The most evident change which has occurred is the enormous increase that has taken place in the volume of data with which the healing art is concerned. Scientific research into the composition, structure, and function of the human body and its reactions to those modifying influences which constitute disease have so enlarged the scope of medicine that it is now admittedly impossible for a single human mind to successfully compass more than one of its departments; hence the development of medical specialism as an accepted mode of practically dealing with the problems of healing. It has come to be generally recognized that in order to be classed as an expert one must needs be a specialist, whereas at the period when dentistry was launched as a separate calling specialism in medicine was so little recognized as to be regarded as unethical. This growth of medical thought toward the recognition of the legitimacy of specialism has led the medical practitioner in the course of time to regard somewhat less critically the special practice of the dentist.

RELATIONSHIP OF THE TWO PROFESSIONS.

The most potent factor which has brought about the present sympathetic relationship of medicine and dentistry is the expansion of the curriculum of dental education so as to include the fundamental branches of medical training, and the consequent production of a class of dental practitioners whose professional ideal is harmonious with that of other practitioners of the healing art in all of its departments.

There remains, however, the fact that the dentist lacks the training which leads to the medical degree, and while his training is such as entitles him to consideration and approval and due recognition for his attainments, the criticism is yet made that he is not a physician, that his training is not a medical training, that his degree is the badge of a partial culture.

In the analysis of criticism of this character the fundamental principle of all education must be given due recognition, viz, that education is ultimately utilitarian in its object. Both physician and dentist are enlisted in the service of humanity; it is for that service that they exist and it is for that service they are trained. It is true that the dentist lacks the educational training that leads to the medical degree, and therefore in a technical sense is not a physician. It is, however, not true that he lacks medical training. The professional education of the dentist today is based upon a curriculum which experience has shown to be best adapted to the necessities of his calling. Its foundation is constructed of all those elementary subjects which constitute the basis of the medical curriculum. In the university dental schools the instruction in the branches fundamental to the medical course is for two years, taken concurrently by the dental and medical classes, and the requirements in those subjects are identical for both, with a few minor exceptions. Upon this medical foundation is erected the superstructure of the special scientific and technical training of the prospective dental practitioner. The further pursuit of the purely medical curriculum and the attainment of the medical degree by the dental student has been found to be impracticable for two reasons:

First, because the acquirement of technical skill in dental art necessitates the development of a degree of manipulative ability which cannot easily be acquired unless its training be undertaken during the period of adolescence. Manual training must always constitute an essential part of the dental curriculum throughout its entire extent. It has been the experience of the majority of those practically concerned with dental education that where training for the development of manual skill is deferred until early middle life, or even past the twenty-fifth year, the attainment of a high degree of dexterity is almost impossible.

In the course of a discussion of this subject at a meeting of the International Dental Federation held at Cambridge,

Eng., in 1901, Sir Michael Foster, deputy vice-chancellor of Cambridge University and the distinguished professor of physiology in that institution, said that he "had for many years past urged that the education of the surgeon should not be delayed too long, because it was impossible after certain years to acquire that suppleness and dexterity of touch which was necessary for success. The mind grows old very slowly, and can be educated even late in life; the body becomes old very soon, and it is necessary to train it while it is really young."

The plan of making the dentist a medical specialist *de facto*, by first pursuing the complete medical course and taking the degree in medicine and then adding thereto the special dental training and its degree, has been frequently tried, but the practical results have been on the whole unsatisfactory, mainly because the training in dental manipulative procedures had been postponed so long as to make a high degree of practical manual efficiency impossible. Practitioners so trained have not as a class rendered as efficient dental service as those who have received their dental training earlier in life and have acquired a broader training in medicine later.

The second reason why the dentist is not technically a medical specialist is that the curriculum of his professional education is now four years* in length, and to acquire both medical and dental degrees would involve an expenditure of time and money undesirable and unnecessary for the average practitioner.

I have dealt somewhat at length with the educational aspect of the question, for it is upon that feature that the relationships of dentistry and medicine are based. I have endeavored to make clear the reasons why dentistry, though essentially a department of the healing art, is not strictly speaking a specialty of medicine, because it has had its origin and development outside the family of recognized medical specialties. It has, however, grown from a common root, developed side by side with medicine, and is

*[The standard at the time this paper was written.—E. C. K.]

growing, as it were, into the medicine of the future.

The art of dentistry, especially in America, has had a wonderful and active growth. Perhaps in no calling of an allied character has greater ingenuity, resourcefulness, and skill been developed than in all that pertains to the technical procedures of dental art. But the problems of pathology confront the dentist in his calling, as they do the specialist who is concerned with any other part of the human body. The dentist is therefore a healer. The therapy of dental and oral disorders requires something more than prosthetic treatment. Indeed, the possibilities of dental mechanic art seem to have reached the stage where they are adequate to meet all conditions to which they are applicable, and it is to the vital side of the problem that dentistry has been and is now addressing itself. The issues with which the dental practitioner is called upon to deal are rarely those of life and death, as in the case of the practitioner of medicine and surgery, but his problems are those which are intimately associated with bodily health, and always with personal comfort. They involve an intimate knowledge of the principles of physiology and pathology as well as of the gross and minute anatomy of the structures of the oral cavity and those surrounding it, together with a general knowledge of the structure of the body as a whole. To the solution of the problems of etiology which oral and dental diseases present must be brought the same breadth of knowledge and intellectual training as is required for the solution of disease problems in other parts of the body. General recognition of this requirement has developed the spirit of investigation and research work among the scientific workers in this department, so that in its advancement dentistry has kept pace with the vanguard in medical research.

ORAL DISEASES AS EXPRESSIONS OF METABOLIC ERRORS.

The idea of a purely local relation for dental and oral disease is fast disappearing and giving place to a more ra-

tional understanding of the interdependence of these pathological phenomena and faulty bodily nutrition. Even so distinctly localized a disease as dental caries is in the light of recent scientific research coming to be viewed as an expression of a diathetic fault or an error in metabolism by which the buccal secretions are charged with a waste product which constitutes the most acceptable pabulum for the development of the caries-producing fungi. There is much evidence to sustain such a view, and if further research should demonstrate its validity the prophylaxis of dental caries would necessarily involve dietetic and constitutional treatment arranged with a view to correcting the metabolic error.

The chemistry of faulty nutrition has received much valuable aid from the light thrown upon its problems through study of the oral fluids. Michaels of Paris has as a result of his investigations announced the proposition that the composition of the saliva varies constantly with certain recognized pathological states. The work of others tends to confirm the general accuracy of Michaels' generalization, and there is being developed a scientific ordering of the data of sialo-semeiology destined to be of the utmost importance in the diagnosis of various types of general malnutrition. Indeed it may be claimed that the study of the chemistry of the saliva affords a more accurate picture of the status of nutrition than does the urine, in view of the fact that the saliva contains those crystallizable substances which are dialyzed directly from the blood through the glands into the mouth in a fluid which is not an excretory waste product as is the urine.

The investigations of dental pathologists into the bacteriology of the oral cavity have shown not only that the mouth is the prolific breeding-ground of many varieties of pathogenic bacteria which are its constant inhabitants, but the still more important fact that the mouth is the portal of entry by which the majority of disease-producing germs find entrance into the body at large. The studies which have been made in

oral bacteriology for the purpose of determining the etiology of mouth lesions have led to much deeper problems than are presented by these purely local disorders. The constant presence of specific pathogenic bacteria in many locally healthy mouths has aroused inquiry into the questions of susceptibility and immunity, together with the more intricate problems of nutrition and the chemistry of abnormal metabolism, as factors of disease predisposition.

To these vital questions dentistry is not only giving practical attention, but is contributing a fair quota of data toward their solution.

DIAGNOSIS OF SYSTEMIC DISTURBANCES THROUGH MOUTH CONDITIONS.

The general proposition that the mouth and its contained organs may furnish objective evidence of constitutional disease is well recognized; but the diagnostic value of such evidence has had mainly an empirical basis. Dentistry is addressing itself to the scientific solution of these oral pathological phenomena and placing their data more and more within the category of ascertained facts to be practically utilized in diagnosis. The trend of this type of dental research is to bring into closer relationship the practitioner of dentistry and the practitioner of medicine, and there is urgent need of this more intimate relationship in view of the more efficient service to humanity which it would insure.

Under present circumstances the dentist is not qualified to form correct judgments as to the problems which confront the practitioner of medicine and with which he is presumably qualified to deal; yet the circumstances of his contact with humanity are such as to place him in a position where his knowledge of the diagnostic importance of oral phenomena will often enable him to recognize serious bodily disease before the patient is himself aware of it, and consequently before the thought of seeking medical advice has occurred to him.

Appreciation of the fact by the medical profession that the training of the dentist qualifies him to recognize and in-

telligently interpret the meaning of these oral diagnostic phenomena would inure to the advantage of both professions as well as to their respective patients.

NECESSITY OF DENTAL TRAINING FOR THE PHYSICIAN.

Or, viewing the matter from the opposite standpoint, there is fully as urgent a need that the practitioner of medicine and of surgery should acquire a closer contact with what assistance dentistry is able to give in the solution of disease problems.

Two cases have recently presented themselves at the dental clinic of the University of Pennsylvania which illustrate this necessity. Both patients were suffering from a suppurative process which was discharging through a fistula in front of the angle of the lower jaw. The first case had been treated for some weeks in the surgical out-patient department of a hospital, a free incision along the lower border of the body of the mandible had been made, and the bone several times curetted, under the belief that the condition was an osteomyelitis with resultant necrosis. The curettement was continued until the roots of a molar were exposed by removal of its outer alveolar plate. In this condition the case was referred to the dental clinic, where it was found that the disorder was simply a dento-alveolar abscess, in which the accumulated pus had burrowed a fistulous outlet upon the face. Extraction of the tooth brought about a cure at once.

The second case was precisely similar, but was diagnosed as a tubercular abscess of one of the chain of cervical lymphatics and was referred by a specialist in tuberculosis to a dermatologist for treatment. The dermatologist made X-ray applications for three weeks with no improvement. The patient applied to the dental clinic for other treatment, and an oral examination revealed that a lower first molar with putrescent pulp was the exciter of the infection which led to the discharge of pus upon the face. The diagnosis was verified by injecting an antiseptic fluid through the pulp-chamber and root-canal of the molar under

slight pressure, with the result that the fluid escaped from the external facial orifice of the fistula. This case promptly yielded to treatment without extraction.

The need for such mutual understanding of the possibilities of both medicine and dentistry as will prevent mistakes of this character seems self-evident. The periodical literature of both professions indicates that as the expansion of what may perhaps be expressed as "the sphere of influence" of each proceeds, the points of contact between them become more numerous. Indeed, there are many instances where no dividing line can be sharply drawn.

While much has been said and con-

siderable attention has been given to the discussion of what may be designated the political or organic relations of the professions of medicine and dentistry, and while it is doubtless right and proper that some formal definition of those relations should be attempted, yet from the point of view of your essayist it seems to be infinitely more important that there should be a general recognition of the need for a closer interrelationship between medicine and dentistry based upon their possibilities for mutual helpfulness. And a consideration of this possibility should convince us all of its advantages both to the science and art of healing and to humanity.

THE INHIBITION OF DENTAL CARIES.

By **GEORGE EDWIN HUNT, M.D., D.D.S., Indianapolis, Ind.**

(Read before the New York State Dental Society at its annual meeting, Albany, May 13, 1904.)

ATTENTION has been frequently called of late to a lack of systematic measures directed toward the prevention of dental caries. Recent contributions to dental literature indicate that sporadic efforts are being made to remedy the defect, but as yet no one has formulated a system that to my mind presents features capable of application to all the great mass of people desirous of preserving their teeth intact. Nor have I any hope of presenting in this paper a system or mode of treatment that will answer all demands, but rather desire to call your attention to certain work now being done along this line and to add my mite in the form of a thought or two. In this paper I will not consider restorative operative procedures as an inhibitory measure, but will refer solely to such practices as may be expected to prevent the initial occurrence of the disease.

Four methods of inhibiting initial carious lesions have been suggested, which for purposes of designation I will term

—(1) Food Selection, (2) Mechanical Cleansing, (3) Chemical Hardening, and (4) Use of Mouth-washes.

(1) FOOD SELECTION.

The field for abstract speculation here is as unlimited as the practicability of the method is limited, but let us glance at it in passing.

Every meal leaves in the oral cavity carbohydrates and proteids, the two groups of substances most necessary for the nourishment of oral bacteria, packed down in fissures, crowded into interproximal spaces, and clinging to the tooth-crowns wherever slight immunity from the movements of the tongue, cheeks, and lips obtains. In many mouths the absolute removal of this debris by the patient is either a practical impossibility, or if the possibility exists the determination is lacking. Hence in the great majority of mouths the characteristic fermentation changes occur after each meal.

The fermentation of carbohydrates is accompanied by the production of certain acids, of which lactic acid is the chief. The decomposition of albuminoids results in an alkaline reaction. When the two are mixed, Miller tells us, they produce as a rule an acid reaction, depending to a degree on the particular form of bacteria acting on the mass, and partly on the nature of the food and the preponderance of carbohydrates in it. Lactic acid formed during the fermentative action of certain forms of oral bacteria on the carbohydrates in the mouth is the active agent in the dissolution of the inorganic constituents of the teeth. Since this is true, it is reasonable to expect that a diet from which carbohydrates have been excluded would result in practical immunity from lactic acid formation. To follow out a system of food selection would result in the elimination from our bills of fare of many cherished luxuries and not a few substances viewed as necessities.

All cereals are rich in carbohydrates. Wheat, rye, barley, rice, corn, and oats all contain starch readily convertible into glucose and that into lactic acid during fermentation. Battle Creek and its breakfast foods would have to go out of business. Cake, pastry, bread, sago, noodles, macaroni, spaghetti, biscuits, waffles, griddle cakes, puddings, and chicken gravy would be on the unfair list. Potatoes, beets, cabbage, turnips, radishes, fruits, preserves, jams, marmalade, jellies, and sugar would be interdicted. Even milk with its small proportion of sugar would be a suspect.

Diet would be restricted to the simple proteids or albuminoids, and the hungry diner would have a choice of beef; veal, mutton, lamb, and pork. Or, in the event that these did not satisfy the need for food, chicken, turkey, game of all sorts, fish, lobsters, crabs, clams, oysters, mussels, and eels may form the *menu* for his meal. Or, since the percentage of sugar in milk is so small, he may risk a glass of sweet milk or buttermilk or eat cheese or Welsh rarebit in lieu of pie. Eggs, peas, string beans, lettuce, and greens are also harmless.

A casual reading of these lists will convince anyone of the impracticability of inhibiting dental caries by food selection, and with one further thought, alien to the subject, I will pass this division. May not the excessively nitrogenous diet usually affected by rheumatics account for the lack of caries so frequently met with in those cases of pyorrhea alveolaris accompanied by the uric acid diathesis?

In treating of food selection as a possible method of inhibiting caries, I have ignored the more recent theory that carbohydrates in the oral secretions are more closely concerned with periods of extreme susceptibility to caries than food débris. I am not aware that definite results have been obtained in this line of work. Even if they have, will not an excess of carbohydrates in the food result in an increased percentage in the oral secretions?

(2) MECHANICAL CLEANSING.

The beneficial effect of thoroughly cleansing the teeth has been persistently and ably presented to the profession by Dr. D. D. Smith of Philadelphia, who ascribes the inhibitory effects of his method to a "change of environment."

Dr. Smith's method, as described by him, consists of the thorough removal of all deposits and the polishing of all exposed surfaces with pumice and orange-wood sticks, manipulated by hand, at intervals averaging one month. It has not been my pleasure to see Dr. Smith operate, nor have I had the opportunity to inspect any of the mouths in which his prophylactic treatment has been employed. My information has been obtained from his papers and from those who have had the opportunity denied by circumstances to me. The mouths of those under his care are striking examples of cleanliness, the gums are firm and healthy, the teeth beautiful in their freedom from sordes, and caries is apparently inhibited. In a paper read in the summer of 1900 Dr. Smith speaks disparagingly of the germicidal value of the mouth-washes now on the market, leaving the inference in the minds of his readers that but little reliance is placed

on the use of drugs for supplementing his mechanical cleansing.

Let me, at the risk of exposing crass ignorance, give you my impressions of this method, impressions derived from the sources of information above set forth. Mechanical cleansing of the exposed portions of the teeth is instrumental in inhibiting caries in direct proportion to its thoroughness and to its frequency. It is evident from the testimony of many that Dr. Smith performs this operation more thoroughly than most practitioners, if not more thoroughly than all others. Hours are spent in carefully removing deposits and in smoothing and polishing the enamel. Were this done but once a year, its beneficial effects would be much lessened. Twelve such cleansings each year are twelve times more valuable than one. It seems sweet reasonableness to admit that a tooth kept clean, as near surgically clean as the conditions will permit, will be less likely to decay than one not so cared for. So this portion of the subject would seem to resolve itself into consideration of the necessities of each mouth. Able men are now at work on the question of immunity. The periodicity of immunity is now generally conceded. During an immune period in any mouth I imagine a monthly treatment such as Dr. Smith gives would be ample, supplemented as it must be by careful attention by the patient *ad interim*, to inhibit caries, but the known rapidity with which enamel becomes etched by caries-producing agencies in some mouths would point to the use of a good wash to supplement the efforts of the patient in my practice.

In Dr. Smith's practice, I presume, fissures are cut out and filled. No manipulation of which I have knowledge can prevent the invasion of caries in fissures due to faulty development. His assertion of increased pulpal activity, accompanied by increased translucency of the tooth-crown, the disappearance of marks indicating embryonic faults and a hardening of the enamel must receive the consideration due a careful observer; but if the future confirms his observations of

enamel changes, our histology of that tissue needs revision. That impacts on the tooth-crown will stimulate circulation in, first, the pericementum and secondly in the pulp, and induce increased nutritive changes in both, is proved by the results of persistent thorough mastication of resistant foods; and while I can realize that a stimulation of the odontoblastic layer the result of a better circulation, due to either Dr. Smith's massage or to chewing resistant foods, may increase the physiological tone of the dentin, the absence of ameloblasts and the histologic structure of enamel makes it difficult to account for atomic or molecular changes in it other than those due to degenerative influences.

The great limitation to the universal success of Dr. Smith's method lies in the non-receptiveness of the mass of people to methods involving as much attention to detail as must be required of those patients following his system. Every practitioner can select certain of his *clientèle* over whom his professional control is such that the method under consideration could be faithfully followed out to its conclusion, but in the practice of the average operator no wholesale adherence to the strict lines of the system need be expected. The mass of our profession cannot select their *clientèle* nor influence them to submit to the rigid requirements necessary to inhibit caries by this method alone.

(3) CHEMICAL HARDENING.

From Basle, Switzerland, in the voice of L. C. Bryan, comes another message to those of the profession desirous of inhibiting dental caries. Dr. Bryan's views were set forth in a paper read before the American Dental Society of Europe at Madrid, in 1893, and consisting of a presentation of results obtained by bathing teeth in a forty per cent. solution of silver nitrate at intervals varying from six months to one year.

Dr. Bryan's method consists of isolating single teeth with the rubber dam and making repeated applications of the solution, allowing each application to dry

before making another. The medicament is forced and worked into sulci and fissures and carefully applied to approximal as well as other surfaces. He states that no discoloration follows its application to sound enamel other than can readily be removed with pumice. Exposed dentin due to leaky fillings, developmental imperfections, caries, or other causes will of course experience the well-known reactions. The inhibitory effect of silver nitrate on exposed dentin has been so frequently exploited as to be familiar to all, and I presume it is unnecessary for me to enlarge on it here. But Dr. Bryan makes certain claims for its action on tooth-structure, based on his clinical experience, that are certainly important, if true. He believes he has observed a stimulation of the odontoblastic layer resulting in nutritive changes in the dentin, leading to a better physiological tone. He does not definitely claim to produce enamel changes, as does Dr. Smith, but implies a hardening even of that structure. He does profess to believe that three treatments a year from the time of eruption of the teeth will inhibit caries absolutely—this without any reference in his paper to the mechanical cleansing advocated by Dr. Smith. It is, however, only fair to suppose that the importance of cleanliness is fully appreciated by Dr. Bryan.

Let us analyze this method and the claims of its advocate. So far as atomic or molecular changes in enamel formation are concerned, clinical experience must be supplemented with other proof if the profession is to accept them as occurring. That bathing the enamel in silver nitrate will produce a change of environment by coating the surface with silver salts is certainly true. The persistence of this coating is not stated by the essayist, but during its continuance it undoubtedly will inhibit the growth of micro-organisms to a degree. On unbroken enamel I believe any such deposit would be removed in the first vigorous cleansing the teeth receive, and I would rather pin my faith to Dr. Smith's method of approximate cleanliness than to a coating of silver salts. The value

of the silver nitrate treatment, it occurs to me, lies in the admirable manner in which it supplements mechanical cleansing in its action on dentin exposed in developmental defects or elsewhere, and inaccessible to manual methods. The action of silver nitrate applied in the manner described by the essayist is so superficial on dentin, that, while slight transient pulp-stimulation may occur, it is doubtful, to my mind, whether any considerable odontoblastic activity is induced. I would rather ascribe the resultant inhibition to the purely local changes produced at the point of application, but in this I may be in error. Some years ago Dr. L. P. Bethel, of Columbus, Ohio, permeated the entire dentin of pulpless teeth with silver nitrate influenced by the cataphoric current, but its penetrative power by osmosis is very limited owing to the impenetrable character of the coagulum produced by it when brought into contact with organic matter.

The new point presented by Dr. Bryan is the bathing, at regular intervals, of the entire tooth-crown with silver nitrate. The method presents undoubted points of advantage, and further advices from his clinical experience will be awaited with much interest. In connection with the best methods of cleansing that may be induced, and a suitable mouth-wash, it should prove a valuable aid in inhibiting dental caries.

(4) USE OF MOUTH-WASHES.

In order to make my argument on this division of my subject it is necessary to again refer to the exceptional mouths in which the environment induces excessive predisposition to decay. The rapidity with which oral bacteria proliferate is remarkable. The production of fermentative changes resulting in the formation of lactic acid is not a question of days or weeks, but of minutes and hours. Ideal dentures, largely self-cleansing, are rare. Atypical dentures with badly guarded interproximal spaces and localities favoring the retention of food debris are, paradoxical as it sounds, the rule.

The majority of people do not thoroughly cleanse their teeth once in twenty-four hours, even in those cases where careful attention to detail in the use of thread and brush would produce nearly complete cleanliness. In many other mouths the utmost efforts of the patient will not produce approximate cleanliness. Intelligent use of the thread and brush will probably remove all solid particles of food from all smooth surfaces, but viscid mucoid secretions due to constitutional disorders may be present in any mouth and present obstacles to the absolute removal of all bacterial food too great to be overcome by ordinary cleansing operations.

It is probably not an unwarranted assertion to state that there are periods in the history of all mouths when immunity from caries-producing influences is well-nigh impossible if mechanical cleansing by the patient alone be the reliance. This is perhaps less true in the selected *clientèle* of Dr. Smith, who has demonstrated to us what may be accomplished by the co-operation of dentist and patient, but the greatest good to the greatest number demands that an effort be made to inhibit caries in the mouths of those who from negligence or thoughtlessness do not adhere to the strict letter of the law regarding mechanical prophylactic measures. A month, in particularly susceptible mouths, is ample time in which to produce definite degenerative effects on approximal surfaces if thread and brush are alone relied on for immunity. It is, therefore, my contention that in all mouths, but more especially so in those whose environment, temporary or otherwise, predisposes to carious action, a properly compounded and used mouth-wash will be found an invaluable aid in counteracting bacterial action. And with this thought in mind, I have, with the valuable assistance and co-operation of Chas. R. Jackson, D.D.S., Phar.G. of the Indiana Dental College, conducted a series of experiments covering several months of time in an effort to ascertain the relative germicidal value of various drugs in strengths permitting their use in the oral cavity.

The technique of these tests, some three hundred in number, was briefly as follows: The teeth and gums were cleansed with the thread and brush after the noon-day lunch, fully as carefully or perhaps with more care than the average good patient would bestow upon this operation. Approximately three hours thereafter the mouth was thoroughly rinsed for one minute with 15 cc., about half an ounce, of the solution selected for that test. A five-minute interval was then allowed in order that the saliva might again bathe the teeth and gums. The mouth was then rinsed with 15 cc. of sterilized distilled water and a culture made in nutrient gelatin, or agar, from $\frac{1}{8}$ cc. of the spittle: this we will call culture A of that experiment. An hour later the mouth was again rinsed with 15 cc. of sterilized distilled water and another culture made from $\frac{1}{8}$ cc. of the spittle; this we will call culture B of that experiment. The culture dishes were kept until the media liquefied from colony development, or until, without liquefaction, repeated observations detected no further development. A careful record was, of course, kept of each experiment.

The solutions used were of the following strengths: Salicylic acid, 1:200; formalin, 1:200; Thiersch's solution, full strength; benzoic acid, 1:200; mercuric chlorid 1:2500 and salicylic acid 1:300; mercuric chlorid 1:3000 and salicylic acid 1:400; mercuric chlorid 1:3000; mercuric chlorid 1:2500.

A number of experiments were also made with various proprietary mouth-washes, merely for the gratification of curiosity. None of those tried developed valuable inhibitory action.

No special interest would attach to a recital of the results in each case, nor have individual cases any great scientific value. The technique employed was selected as adapted to give results of direct value when a number of experiments with the same solution were considered together. If similar experiments have been conducted, I am not aware of them. The method had the advantage of giving a good

idea of the condition of the saliva shortly after using the solution, and it indicated the persistent inhibitory action of the solution by the results obtained in the second experiments. Anyone conducting similar tests will note great variations in the numbers of colonies developed after the use of the same solution on different days when the conditions each day are as nearly the same as it is possible to make them. These variations are accounted for, I presume, by differences in the oral secretions and by diversities in the form of bacteria predominating in the mouth on the day the test is made. Once during the experimental work Dr. Jackson experienced a mild attack of tonsillitis, and the tests made by him during that time showed a large increase in colonies over those made with the same solution at other times. Quite often apparently incomprehensible results would be secured in which the first test would give tens of thousands more colonies to the spittle than the second test. In these cases I suspect a fragment of mucous membrane or a minute particle of food unmoved by the noon-day cleansing, but washed away from its mooring by the vigorous rinsing with the water, found its way into the culture media and inoculated it with many thousands of bacteria. These variations indicate the fact that only a comparison of many experiments with each solution is of value.

I am well aware that the number of micro-organisms in the spittle does not indicate the number present in the mouth, but it is fair to assume that a proportional relation exists between the number in the saliva and the total number present in the oral cavity. Thiersch's solution is composed of salicylic acid 4 parts, boric acid 12 parts, water 1000 parts. In our tests it did not prove of great value. Two A cultures made by Dr. Jackson showed only 1080 and 2200 micro-organisms respectively, but the other eight A cultures ran from 50,000 to 2,025,000 colonies to the 15 cc. of spittle. The B cultures varied from 13,140 to 7,200,000, most of them being in hundreds of thousands.

Thiersch's Solution.

No.			GELATIN.	Total A.	Total B.
42-43	Dec. 14	Hunt	.....	93,420	189,900
44-45		Jackson	...	1,080	450,000
AGAR.					
50-51	" 16	Hunt	.....	225,000	630,000
52-53		Jackson	...	2,025,000	3,600,000
GELATIN.					
86-87	Jän. 7	Jackson	...	2,200	720,000
88-89		"	...	1,800,000	7,200,000
152-53	Feb. 2	Hunt	.....	17,100	45,000
154-55		Jackson	...	56,700	13,140
156-57	" 3	Hunt	.....	51,030	54,990
158-59		Jackson	...	360,000	1,080,000

Formalin 1:200 showed considerable variation from day to day. Three A cultures showed as few as 1440, 1800, and 1980 colonies respectively, but the B cultures of these experiments showed 360,000, 720,000, and 225,000, indicating but little persistency. All of the B cultures ran into hundreds of thousands, and in no B culture was there less than in the A culture of that experiment. This strength of formalin bites quite sharply and is fully as strong as any mouth could stand. The results from its use were distinctly disappointing.

Formalin 1:200.

No.			AGAR.	Total A.	Total B.
54-55	Dec. 17	Hunt	.....	900,000	360,000
56-57		Jackson	...	2,880,000	7,200,000
58-59	" 18	Hunt	.....	45,000	675,000
60-61		Jackson	..imperfect		5,400,000
GELATIN.					
70-71	" 23	Hunt	.....	1,980	225,000
72-73		Jackson	...	1,440	360,000
78-79	" 31	"	...	11,160	imperfect
80-81	Jan. 2	"	...	1,800	720,000

Benzoic acid 1:200 gave better results than the same strength of formalin, and in three cases seemed to indicate cumulative action by showing a smaller number of colonies in the B than in the A cultures, but the number of experiments was entirely too few to serve as a basis for a conclusion. The smallest number obtained in an A culture was 720; all other A cultures were in five figures, varying

from 10,350 to 72,000. The four best B cultures ran from 1800 to 6980, but two others showed 360,000 cultures each. On the whole, benzoic acid in that strength made a fair showing, and to our minds ranks above Thiersch's solution and formalin as a mouth-wash.

Benzoic Acid 1:200.

No.			Total A.	Total B.
GELATIN.				
90-91	Jan. 12	Hunt	72,000	360,000
92-93		Jackson ...	11,700	360,000
AGAR.				
94-95	" 13	Hunt	720	1,800
96-97		Jackson ...	13,500	5,400
GELATIN.				
130-31	" 25	Hunt	18,000	6,980
132-33		Jackson ...	10,350	3,420
134-35	" 26	" ...	12,780	36,000

Salicylic acid 1:200 presented but little evidence of continuity of action, nor was it uniformly effective in the A cultures. Two A cultures showed as few as 900 colonies, but the B cultures following these developed 225,000 and 360,000 colonies respectively. In two completed experiments only did the B cultures show fewer colonies than the A, and a review of the record convinces me that these two cases might more safely be ascribed to errors in technique than to the efficiency of the solution.

Salicylic Acid 1:200.

No.			Total A.	Total B.
GELATIN.				
38-40	Dec. 9	Hunt	2,250	1,800
39-41		Jackson ...	13,500	<i>no record</i>
46-47	" 15	Hunt	1,800	85,500
48-49		Jackson ...	900	360,000
AGAR.				
50-51	" 16	Hunt	225,000	630,000
52-53		Jackson ...	2,700,000	3,600,000
GELATIN.				
74-75	" 29	Jackson ...	3,150	1,800,000
76-77	" 30	" ...	3,600	720,000
98-99	Jan. 14	Hunt	4,500	270
100-01		Jackson ...	24,300	585,000
102-03	" 15	Hunt	18,000	180,000
104-05	Jan. 15	Jackson ...	900	225,000
148-49	" 30	Hunt	4,500	5,400
150-51		Jackson ...	5,580	135,000

Mercuric chlorid in aqueous solution and in various combinations gave by far the best results obtained. The 1:3000 solution did not indicate a great amount of persistency of action nor could cumulative action be safely credited to it from the few completed experiments made, but in the strength of 1:2500 some uniformly gratifying results were obtained. In ten completed experiments, the latter two being made with the addition of thymol 1:2500, four indicated augmented inhibitory action as shown by the B culture, and all but one clearly show a persistency found in none of the preceding experiments. In one A culture absolutely no colonies developed. With one exception the variation in the A cultures was from this to 3600 cultures. The B cultures, with the exception of two showing 18,000 and one 9450 colonies, developed from 360 to 3240 colonies only.

Mercuric Chlorid 1:3000.

No.			Total A.	Total B.
GELATIN.				
82-83	Jan. 4	Jackson ...	2,880	900,000
84-85	" 6	" ...	1,260	720,000
106-07	" 16	Hunt	1,350	2,700
108-09		Jackson ...	16,200	2,700
110-11	" 19	Hunt	12,600	135,000
112-13		Jackson ...	108,000	900,000
144-45	" 29	Hunt	2,520	4,500
146-47		Jackson ...	16,110	540

Mercuric Chlorid 1:2500.

No.			Total A.	Total B.
GELATIN.				
62-63	Jan. 7	Hunt	1,080	9,450
64-65		Jackson ...	2,700	3,240
66-67	" 8	Hunt	2,610	2,250
68-69		Jackson ...	<i>none</i>	900
136-37	" 27	Hunt	1,260	1,980
138-39		Jackson ...	3,600	1,620
140-41	" 28	Hunt	90	18,000
142-43		Jackson ...	270	360
225-26	Mar. 8	Hunt	24,750	18,900
227-28		Jackson ...	2,790	1,620

The effect of the addition of salicylic acid to mercuric chlorid was tested to some extent. A solution containing 1:3000 mercuric chlorid and 1:400 salicylic acid was used in eight experiments. The results were not especially gratifying; neither the effectiveness nor per-

sistency of the mercuric chlorid seemed to be increased by the addition of the salicylic acid.

Mercuric Chlorid 1:3000 and Salicylic Acid 1:400.

No.			Total A.	Total B.
GELATIN.				
118-19	Jan. 21	Hunt	1,710	7,650
120-21		Jackson . .	58,500	54,000
122-23	" 22	Hunt	900	36,500
124-25		Jackson . .	3,600	18,000
126-27	" 23	Hunt	4,950	5,400
128-29		Jackson . .	18,000	9,450
176-77	Feb. 12	Hunt	4,950	5,400
178-79		Jackson . .	450	failure

Mercuric chlorid 1:2500 and salicylic acid 1:300 showed much better results. Continuous action was indicated in six of the eight experiments, and the efficiency of the solution is undoubted. Comparison of the results obtained by each of these drugs without the other leads me to believe that the efficacy of the mixture is due to the mercuric chlorid, however, and that the salicylic acid added nothing to its value.

Mercuric Chlorid 1:2500 and Salicylic Acid 1:300.

No.			Total A.	Total B.
GELATIN.				
160-61	Feb. 8	Hunt	6,570	19,080
162-63		Jackson . .	1,080	1,080
164-65	" 9	Hunt	8,100	67,500
166-67		Jackson . .	none	450
168-69	" 10	Hunt	90	180
170-71		Jackson . .	1,070	540
172-73	" 11	Hunt	4,950	2,700
174-75		Jackson . .	270	720

The taste of mercuric chlorid is obnoxious to many persons. In an effort to disguise the flavor and to increase its palatableness, solutions of the drug in the strength of 1:2500 were made with gaultheria water. Later, varying percentages of menthol, thymol, glycerin, and oil of eucalyptus were used. These disguised the metallic taste of the mercuric chlorid without, seemingly, affecting its inhibitory action. The following was finally decided on as the formula best suited to our taste:

R—Mercuric chlorid (1:2500),	0.400 gm.
Menthol (1:3000),	0.333 "
Thymol (1:10,000),	0.100 "
Oil eucalyptus (1:10,000),	0.100 "
Alcohol,	30.000 "
Glycerin (1:50),	20.000 "
Gaultheria water,	q. s. ad 1000.000 "

This may be varied at the desire of the user. In my opinion the mercuric chlorid is the only ingredient offering definite inhibitory properties, so that variation in the strengths of the remaining ingredients will neither add to nor subtract from the efficacy of the solution and may be made with the sole object of pleasing the sense of taste.

Twenty completed experiments with approximately the above formula offer fairly uniform and very gratifying results. Continuous action during the hour intervening between the A and B cultures is indicated in every experiment. In thirteen of the twenty a decidedly augmented action of the solution is indicated by the B cultures, and in one other the number of colonies developing in both cultures of a completed experiment was the same. It is therefore fair to claim that seventy per cent. of the experiments made indicated cumulative action of the solution.

After 228, to 268, all tests are with mercuric chlorid 1:2500 with various ingredients of which menthol, thymol, glycerin, eucalyptus, and gaultheria water formed a part.

Mercuric Chlorid 1:2500 with various ingredients.

No.			Total A.	Total B.
GELATIN.				
229-30	Mar. 10	Hunt	7,830	2,160
231-32		Jackson . .	5,220	4,950
233-34	" 11	Hunt	810	1,620
235-36		Jackson . .	1,800	540
237-38	" 12	Hunt	450	270
239-40		Jackson . .	810	180
241-42	" 15	Hunt	990	11,700
243-44		Jackson . .	540	630
245-46	" 16	Hunt	1,800	2,070
247-48		Jackson . .	4,050	900
249-50	" 17	Hunt	900	1,620
251-52		Jackson . .	2,430	900
253-54	" 21	Hunt	7,470	1,440
255-56		Jackson . .	5,580	1,710

No.			Total A.	Total B.
257-58	Mar. 23	Hunt	2,520	2,520
259-60		Jackson . . .	1,080	13,050
261-62	" 25	Hunt	3,600	1,260
263-64		Jackson . . .	6,750	1,260
265-66	" 31	Hunt	720	630
267-68		Jackson . . .	1,440	360

As stated earlier in this paper, experiments conducted on the lines laid down are only valuable in the mass. Variations of oral conditions may influence individual experiments and render conclusions drawn from them utterly erroneous. The law of averages alone will make them of value. Whether enough completed experiments were made with each solution to formulate definite conclusions is a question. I can only say that we approached the work without preformed opinions, and are satisfied that the results obtained indicate the truth.

THE GENERAL RESULT.

The inevitable conclusion to be drawn from these experiments places mercuric chlorid in a class by itself as an agent for inhibiting the growth of oral micro-organisms. No other wash clearly indicated even a uniform continuous action, and certainly none other can be credited with increased efficacy an hour after using.

I regret that the limit of time and the exacting nature of laboratory work did not permit us to make further tests for continuous and augmented action. The fact, however, that thirty per cent. of cases showed a diminished action at the end of one hour leads me to believe that an interval of two hours would show an increase of colonies in practically all B cultures. This, however, should be tested.

There is a decided prejudice against the use of mercuric chlorid as a mouth-wash. In certain idiosyncratic conditions, constitutional effects may be produced by very minute doses. Idiosyncrasies frequently exist in relation to strawberries, quinin, and cocain also, but strawberries are still eaten, and quinin and cocain are still used. An average amount of liquid with which to rinse the mouth is 15 cc., or about half an ounce; 15 cc. of a 1:2500 solution of mercuric

chlorid contains 0.006 gm., equivalent to 0.09 grain. The maximum internal dose of mercuric chlorid where no idiosyncrasy exists is placed by different therapeutists at from 1/6 to 1/10 grain. In our work no effort was made to ascertain the amount of mercury ejected in the spittle, so that any statement I make on that score must be considered solely as an opinion. The ejected spittle was observed, and the variation in amount between it and the wash taken into the mouth was too small to measure with a graduate. Granting that an exchange of wash for saliva occurs in the mouth, I believe that one-tenth would be an excessive amount of wash to remain after the ejection of the spittle. If one-tenth did remain it would mean that 0.0006 gm., equivalent to 0.009 grain, or less than 1/100 of a grain, of mercuric chlorid was present and perhaps subject to absorption by the mucous membrane of the alimentary tract. The possibilities of untoward effect, unless the whole wash is swallowed, would seem too remote for serious consideration. I have used the formula given above from two to four times daily for the past eight weeks without untoward effects.

THE PRACTICAL LESSON.

To conclude: In my opinion, any method looking to the inhibition of dental caries in those mouths characterized by excessive predisposition to decay should take into account the extreme rapidity with which oral micro-organisms proliferate and should embrace features calculated to reduce this acid-producing action to a minimum. The inhibitory action of mercuric chlorid is unequaled by that of any other substance capable of being used as a mouth-wash. I can therefore see no more reason for withholding it in those cases where its use is clearly indicated than I can see reason for the laryngologist dispensing with silver nitrate, zinc chlorid, trichloroacetic acid, chromic acid, potassium permanganate, cocain, carbolic acid, or mercuric chlorid itself, in his treatment of local conditions, for fear they might cause untoward effect if

taken into the stomach. I do not advocate the general and unrestrained use of mercuric chlorid as a wash, any more than I would advocate the constant use of homatropin to increase the beauty of the eyes or the regular use of arsenic to clarify the complexion, but I do contend that in those cases clearly indicating the necessity for extraordinary efforts, if the

loss of tooth-structure is to be minimized, the dentist is not only justified in prescribing it with due instruction, but will be remiss if he does not avail himself of its undoubted inhibitory action to check the proliferation of caries-producing micro-organisms during the period intervening between the mechanical cleansing of the enamel surfaces.

PORCELAIN: ITS SCOPE AND INFLUENCE ON OPERATIVE DENTISTRY.

By **W. T. REEVES, D.D.S., Chicago, Ill.**

(Address before the Seventh District Dental Society of the State of New York, at Rochester, N. Y., April 1903.)

PORCELAIN is a potent word; it holds the attention of the whole dental world today. Everything that is printed on that subject is eagerly sought and carefully read; all discussions are earnestly entered into and attentively listened to. Porcelain is the enlivening and attractive feature of all dental meetings. It has forged its way to the front after a hard-fought battle with conservatism, and having won its spurs, porcelain takes its place as a crowning glory to the dental profession in this wonderful twentieth century of progress and achievements.

At this date I do not need to argue for its acceptance or defend its use; all there is to do today is to enumerate its great range of application and to simplify the technique of manipulation so that positive, definite results may be accomplished by all. Principles have been evolved that when thoroughly mastered and carefully executed will yield results that will be ideal. We have looked all these years for a material that would be an ideal restorer of lost tooth-structure. In porcelain we have the only material that fulfills all the demands and possesses all the qualities demanded of an ideal material, viz, application, harmony, preser-

vation, compatibility, ease of insertion, and permanence. Gold has been called the sheet anchor of American dentistry, but how far short it comes of filling any one of the foregoing requisites!

APPLICATION.

There is no material we have today that has so extended a range of application as porcelain; there is practically no place in which porcelain cannot be used as a restorer of lost tooth-structure. Porcelain is only limited in application by the limitations of the operator.

There are a few places where gold is a safe material to use and where its insertion would be accomplished in less time than porcelain, and for that reason the patient's welfare would be conserved. I will enumerate all such conditions: The sulci of the bicuspid, no other surfaces being involved; the sulci extending from the distal pit over on the lingual surface of upper molars; the pit in the cingulum of anterior teeth; pinhead cavities that are not in sight. All of these would not be larger than a No. 2 or No. 3 round bur would cut, and could be quickly and safely filled with gold. In all other cavities the patient would be best served by the use of porcelain.

HARMONY.

There is no other material that begins to approach porcelain in harmonizing with the teeth. With porcelain we can restore extensive loss so that at close conversational range you do not detect that artificial restoration has been resorted to. Gold would be a permanent disfigurement to such a mouth. Only our familiarity with such sights accounts for the fact that it has been tolerated in the past. That time is passing fast; patients are finding out that they can have fillings that cannot be detected instead of the hideous display of gold, and they are demanding that kind of work. When the gold fillings in such a mouth have been replaced by porcelain, the transformation is so great that one is astonished and wonders how gold was ever tolerated at all.

PRESERVATION.

A filling material to be ideal must have the quality of preserving the teeth. Porcelain is *par excellence* in this respect; it is a clinical fact that there is seldom or never any recurrence of decay around a porcelain filling. In a period extending over ten years the writer has yet to have the first case of recurrence of decay about a porcelain filling. This is an astonishing condition, and as far as my observation extends porcelain is just as successful in those desperate cases where all our efforts fail to check the ravages of decay as in those mouths that are practically immune from caries.

You all have patients, particularly the young, for whom your best efforts fail to bring about any change of condition, and their teeth are going all to pieces; cements wash out so fast as to be dangerous; any metallic filling would fail within the year, and the second state would be worse than the first. You dread their coming to the office because your efforts are not rewarded with the success your average work accomplishes. Try porcelain, and your troubles will be over. I could cite any number of cases of this kind where the filling of all cavities with porcelain has produced results that are simply marvelous. Those teeth that are

so broken down that they would be condemned to be crowned, teeth where there is so little tooth-substance left that you could not get retention that would hold a gold or amalgam filling—instead of still further weakening such a tooth by trying to cut retention, you would strengthen it by using porcelain to restore full contour and preserve it for many years of usefulness.

A great deal more could be said along these lines, but I can demonstrate any time from my own practice that porcelain possesses the quality of tooth-preservation.

COMPATIBILITY.

This is a quality that an ideal material should possess. Not having a material that possessed this quality, it is no wonder that this condition should have escaped the observation of the majority of inlay workers. Porcelain is compatible with tooth-structure to the extent of practically restoring said tooth to a normal condition. Even where you have an exposure of the pulp, if the pulp be in a healthy condition, *i.e.* if the drop of blood is of the bright red, arterial color, you can make and insert a porcelain filling with the confidence that there is little likelihood of any trouble from that tooth; anything less than that, with almost absolute certainty of no trouble. In these same cases—no matter how carefully you protected the pulp with all the means at your disposal, you are not surprised if the pulp dies under a gold or amalgam, or even an all-cement filling. I have never had a pulp die under a porcelain filling. I will not try to answer why this is so; I think it is compatibility of material to tooth.

EASE OF INSERTION.

Now you will think I am “up against it” when I advance ease of insertion as one of the qualities of porcelain. Ease does not necessarily mean quickness. If you are taking things easy you are, as a rule, not hustling very hard or fast. As an illustration I wish to quote the case of a patient, a young lady eighteen years old; the tooth a lower first molar, center

third of buccal and lingual walls decayed almost to the gum, all other walls intact but with so little dentin supporting them that no retention could have been cut for a gold or amalgam filling. If one had succeeded in putting in a gold filling the walls would have broken away in a short time. The cavity was prepared with the minimum amount of cutting, all decay was removed, a few slight undercuts filled in with cement, margins polished, and we were ready to form the matrix. The preparation of the cavity was accomplished without much discomfort to the patient and no loss of good tooth-structure. A matrix was burnished in about fifteen minutes, then the patient took a rocking-chair and read the magazines. The filling was completed in four bakings, baking forty-five minutes. The rubber dam was then put on and the inlay set, the patient waiting with the dam on thirty minutes.

It would have taken me from an hour to an hour and a half longer to have put in a gold filling in that cavity, it would have been hard work all the time, and the patient would have left the chair exhausted, with no desire to have such an operation repeated. As it was, she hardly realized that she had been to the dentist, for the work was accomplished with the minimum taxation upon both patient and operator. Smaller and less difficult cavities demand proportionately less taxation.

PERMANENCE.

Permanence and preservation are conditions that might seem synonymous—a distinction without a difference; but one condition could be filled and the other could not. For instance, a large amalgam or gold filling may be in position and doing service for fifteen or twenty years, and still not be preserving that tooth for the last half of that time; for the tooth suddenly goes all to pieces, or on removal of the filling on account of trouble, we find that the whole interior is gone through recurrence of decay under the filling. That would not be preservation of the tooth, while it might be con-

sidered to fill the condition of permanence. A porcelain filling would have done both—for one will never find such a condition under a porcelain filling; porcelain fillings are lasting longer and preserving teeth better than any other material we have ever used. They make ideal fillings for the young, the middle-aged, and the old. Anyone who does not accept this must be expecting to reappear on earth and practice dentistry when the millennium comes.

INFLUENCE OF PORCELAIN ON OPERATIVE DENTISTRY.

Porcelain has made its influence felt along the entire line. To start with, porcelain is an ideal material. Second, the standard to work up to is an ideal standard, *i.e.* the perfect reproduction of nature's handiwork. The standard is threefold—adaptation, contour, color. When a person is working with an ideal material, up to an ideal standard, he cannot help becoming to a more or less extent an idealist. Working under these conditions means working at one's best. Porcelain makes the operator work at his best. Conscientious effort is always rewarded by success, success stimulates to greater effort, the goal is placed higher and higher until the task that was impossible in the beginning becomes the possible, and the influence of working at one's best is felt in all lines of work.

Working to the ideal adaptation. Here is a positive, definite condition to work to. Everyone can and does know whether he has achieved success in adaptation before the filling is set, and nothing short of perfect adaptation should be allowed to pass. With other materials it is not possible for us to know at all stages of the work that some defect has not crept in and escaped our notice; for instance, in condensing a gold filling we may bridge across in some part of the cavity, or a piece of gold may become contaminated and fail of good cohesion, sticking enough to allow completion of the filling, only to scale off when finishing it or a few days later. At the time the defect may not seem grave enough to warrant

our imposing the strain upon the patient of removing the filling and beginning over again—we put it that way to ease our conscience; we have allowed a defective piece of work to pass out of our hands, and our moral tone has been lowered. With porcelain everything is different; if we have failed in adaptation there is no strain upon the patient to make another matrix; we have lost a little time, but there is no physical strain to deter us from making a second filling as there is in the other work. (Physical exhaustion is a very potent factor in the passing of work which, were we in good condition, would not pass muster.)

Our second filling is a success, and the effect upon the operator is twofold: A failure overcome is a stimulus to renewed effort, and the conscience is strengthened and the moral tone raised. This possibility of knowing whether the work is right before it is too late to make corrections is where I look for the great benefit to the laity from the use of porcelain as a filling material. I believe it to be possible for every dentist to acquire the skill that will accomplish adaptation. He may be 'way off in color and not much better in contour, but if he has adaptation he will preserve teeth. These inlays would be called very poor inlays, but think what is the quality of his gold work!—it will not average up to his porcelain for preserving teeth. Throughout the whole profession I believe the efficiency of the poorest operator will be increased twenty-five per cent. through the use of porcelain over what he has accomplished with gold, and that the average operator will do fifty per cent. better service for his patients. And when you come to the skilful man, you cannot measure his increase by percentage; but if it were nothing more than the twenty-five per cent. increase, what a great thing even that would be!—humanity being benefited to that extent through our use of porcelain.

Working to the ideal contour. With porcelain it is possible to restore perfect contour, to reproduce contact points and preserve perfectly the interproximal space—better than with gold, amalgam, or cement. How many there are who do not

separate to gain working space or to restore the tooth to original form! If working space be needed, the file or saw is resorted to, and then the teeth close together with less interproximal space than before; or, as is more often the case, they remove the decay and insert the gold or other material, then finish as best they can. The result is a flat filling. Decay may be arrested for a time—and that is one of the least of our duties—but the mouth has not been placed in a comfortable condition; the patient cannot masticate properly or with comfort. That this is the way the majority of operators fill teeth, there is no gainsaying. In most new patients that come under one's care this is the class of work that is in their mouths.

With porcelain all is different. It is absolutely necessary to have working space, and to obtain that space before the operation is begun; having obtained it, full contour of tooth will be the result. No more space is needed than should be obtained for any other material; and the operator who through necessity is forced to separate, will find that he is doing so much better work and that his patients appreciate the changed conditions so much that he will separate for all other material and not consider it time wasted. In this way the character of his work will be raised, and he will be working to an ideal standard.

If there were nothing else in it, the fact that porcelain brings about this changed condition would be sufficient to cause us to consider it one of the greatest blessings that ever came to the profession. Proper contouring is of great benefit to our patients; with porcelain this can be accomplished to perfection. If you have over-contoured in baking, the filling can be ground to form and to contact point before setting and before the matrix is stripped off, and then glazed in the furnace; or, if there be lack in contour, more can be built on. Either is accomplished without any strain on patient or operator, and for that reason the operator will accomplish perfect contour and restoration of interproximal space before setting the inlay.

Working to the ideal in color. In this respect porcelain has no competitor. It is possible with it to restore lost tooth-structure so that at close conversational range it cannot be detected. This is the quality that most consider of greatest importance; I place it last. It is true that when porcelain work was first taken up that was the reason for its use, and it was only as time demonstrated the other good qualities that its employment was carried farther and farther back in the mouth, until now I use porcelain in all cavities in all teeth, because it preserves teeth better than any other material.

A FEW PRACTICAL SUGGESTIONS.

So much can be said upon all the conditions I have merely suggested or outlined that it is hard to keep within the limits of a single paper, and I do not want to weary you by undue length, so I will pass on to a few practical hints or suggestions before closing. Success makes an enthusiast, and enthusiasm is a good thing when held within the bounds of what one can demonstrate. Method and technique I expect to demonstrate in a practical clinic, so will not take your time to go over details now. One thought I want to suggest that would be fruitful for discussion. How is the profession to acquire its skill and knowledge in the technique of the work? I had intended to elaborate this thought, but think it best to leave that to be brought out in the discussion if time permit.

Cavity formation is the first procedure in the operation. The outline of the essentials in cavity formation is simply—all decay removed, sound glistening enamel reached, margins beveled to a knife edge with the outer plane of the tooth, all undercuts obliterated so that what is burnished into the cavity can be withdrawn without springing, a seating form for setting purposes and for self-identification.

Matrix formation, I believe, is best accomplished by direct burnishing into the cavity, employing such means that will insure fixity of metal while burnishing. No one will claim that as accurate results

can be obtained by working upon a model once, twice, or thrice removed, as from working upon the original; therefore save time and accomplish accuracy by burnishing the matrix into the cavity.

Selecting the color. Each one must work out his own salvation. I can but outline the principle you should work to. The colors in a tooth are underlying colors, and it is underlying colors you want to look for. When you look at a tooth in this way, the different colors you will find will surprise you. Just in proportion as you can see the colors and then reproduce them in the inlay will you be successful in matching inlay to tooth. Never mix two or more bodies together to vary the shade of one. The shade guide furnished with every outfit of bodies indicates the color they will bake if you bake the same bulk and bake to a full glaze. You can get any shade of a given color by the thickness of the layer you bake. Bake your inlay in layers. This accomplishes three things: Translucency, avoidance of shadow, and prevention of cement showing from underneath. Baking in layers is the only way translucency so desirable can be obtained. Bake in your colors strong enough that reflecting through an overlying layer gives you the shade you want; that gives translucency. By baking in layers the strata breaks up light absorption and refraction and the inlay will look the same from all points of view. The same principle prevents the cement showing through from underneath.

Do all grinding necessary before stripping off the matrix, and return to the furnace and glaze. The glazed surface of porcelain is a protection to surrounding tooth-surfaces. *

Remove glaze from the reverse side of the inlay with hydrofluoric acid. This will give a roughened surface that cement will adhere to, and not destroy close adaptation to all parts of the cavity. Put on rubber dam wherever it is possible for setting inlay. Thoroughly dehydrate the cavity with alcohol and warm air.

Mix the cement to thick creamy consistence. Flood the cavity with cement

so that when the inlay goes to place no air-space can be formed.

Obtain pressure by wedge or ligature. Cement crystallizing under pressure gives the best results.

Allow thirty minutes for crystallization before the removal of pressure and dam.

Remove excess cement, but leave the slight line of cement at joint to wear away. It will wear away in a few days.

Advise patients that the tooth in drying out is several shades lighter, that it will be several hours before it is back

to color, and that in a week's time it will look better than on the first day. Also, that they will always be able to see the inlay; that it is like a puzzle picture in the paper—after you have solved the picture you can always see it; others will have to look closely to discover any filling in the tooth.

I hope I have brought thoughts that may stimulate some to enter upon the work, and to those engaged in the work, to a still more extended use of porcelain—for porcelain is the coming material.

EXTENSION FOR PREVENTION: A STUDY OF CONDITIONS IN THE MOUTH.

By **FREDERICK B. NOYES, B.A., D.D.S., Chicago, Ill.**

(Read before the Seventh District Dental Society of the State of New York, at Rochester, March 29, 1904.)

MR. PRESIDENT, AND MEMBERS OF THE SEVENTH DISTRICT DENTAL SOCIETY: It gives me great pleasure to be with you this evening, and especially to speak on the subject which has been assigned to me. I recently had the pleasure of meeting with the Odontological Society of Western Pennsylvania, to make an appeal for the value of the professional portions of our dental training, and this might be made a continuation of the subject, for "extension for prevention" might be spoken of as the study of the treatment of caries of the teeth as distinguished from the "plugging of cavities." When in 1891 Dr. Black first made use of the phrase which has attracted so much attention, it was as a result of his close observation of the conditions and positions of beginning caries of the enamel, and throughout the bitter opposition and in spite of quibbling sophistry which has sometimes been waged against the idea, he has maintained the same simple position, "Study the positions and conditions of beginning decay of the enamel, and plan and ex-

ecute filling operations with reference to them." This constitutes extension for prevention.

DETERMINING FACTORS IN "EXTENSION."

It is my purpose to confine myself to a study of the appearances which are the determining factors in extension. In the beginning it may be well to say that I am speaking of extension for prevention, not extension for convenience, extension for retention, or extension for contention.

The earliest observers of caries of the teeth noticed that decay begins at points upon the surfaces of the teeth, the tissue being affected by acids produced at the point of attack. The philosophy of filling, therefore, is that if the point of attack is cut out and replaced by an indestructible substance, the tooth is less liable to attack in the future.

Here we have the whole argument for and against extension for prevention. Those who oppose the idea take the ground that if the portion of the tooth which has been disintegrated be removed

and replaced by indestructible material the tooth is no more liable to attack in the future than it would be if it were perfect in structure; and we certainly would not think of cutting into a perfect tooth and making a filling because it was possible that it might decay in that place some day.

On the other hand, extension for prevention is really a carrying of the original reasoning a little farther. While it is true that the teeth are attacked at points, the area of the attack differs greatly in different instances, and the intensity of the attack is always greatest at the central portion of the area. When, therefore, a cavity has been produced at the center of the area there can be no logic in advising the replacement of the lost portion of the tissue without removing the portions which are already showing signs of attack by the process.

The problem then becomes the recognition of the conditions which determine the size and shape of the areas of the tooth-surface which are liable to the attacks of caries. In this study there are many things to be taken into consideration, all of which are greatly modified by what may be called systemic susceptibility and immunity. Of these perhaps the first in importance is the manner of the attack and disintegration of the enamel.

ACTION OF CARIES IN THE ENAMEL.

We can recognize two very distinct positions of attack in the enamel which present very characteristic appearances and manner of progress. First, attacks beginning in natural defects of structure, such as fissures and pits; second, in portions of smooth surfaces which are so protected from the friction of mastication as to afford lodgments for the gelatinous plaques which confine the acid products of microbic action.

We may consider the occlusal pits and fissures as typical of the first class, for whether on occlusal or axial surfaces these defects are in positions which would be kept cleaned and polished if it were not for the rough and imperfect

structure of the surface. Even with such defects we may have a degree of immunity which will prevent the attack on the tissue. When caries occurs in these defects the opening of the pit or fissure is kept constantly cleansed and the acids formed are removed so rapidly that they do not attack the tissue; but in the depth of the crevice they are less rapidly removed, the opening often being blocked by foreign materials forced into it, and they are neutralized by the inorganic salts of the enamel, which they dissolve. In this action of acid upon the enamel we find that the cementing substance between the rods is first attacked, injuring the structure to a considerable depth. We find, therefore, that the destruction of tissue progresses most rapidly at the bottom of the pit or fissure, spreading laterally as well as toward the dento-enamel junction, and a considerable area of disintegrated tissue may be produced, or an actual cavity, without increasing the size of the original defect at the surface. This manner of spreading is characteristic of attacks beginning in natural defects. As soon as the dento-enamel junction is reached the destruction progresses more rapidly in the dentin at that point, which may lead to the entire undermining of the enamel without forming an opening on the surface which will attract any more attention than the original slightly imperfect fissure.

The points of attack upon smooth surfaces bear no relation to the character of the tissue, the most perfectly organized apparently being as subject to destruction as the most imperfect, but are determined by the conditions in which the surfaces are placed and the character of the secretions which bathe them. In these points there is usually a center which represents the most favorable condition, and at this point the attack is most rapid and most penetrating, fading out in intensity toward the borders of the area to points which are constantly cleansed and which constitute areas of relative immunity. This produces an appearance in the tissue the reverse of that presented in attacks beginning in natural defects. In studying these areas of at-

tack I have been surprised at the extent and the depth to which the tissue was affected without producing an opening which would be detected by an instrument. The cementing substance seems to be removed from between the rods, but they have not yet crumbled to pieces. Such spots in enamel will cut like chalk, and in grinding sections the tissue will usually crumble to pieces. These areas look white by reflected light or as seen on the tooth, if the attack is recent, because the light is refracted and diffused in passing through the rods and the surrounding air-spaces. If the conditions have changed and a state of immunity has occurred which has inhibited the action of the micro-organisms, the spaces in the tissue may be filled by foreign materials which become dark in color, and the white actively growing spot becomes a stationary dark brown or black spot. It not infrequently happens that such superficial attacks are arrested by the coming of immunity before the tissue has been penetrated.

The beginnings of caries on smooth surfaces, then, are characterized by more or less broad areas of superficial disintegration, penetrating in a point corresponding to the point of greatest intensity, until the dentin is reached. The appearances can be well shown in sections through beginning decay.

EXTENSION AS APPLIED TO NATURAL DEFECTS AND TO CAVITIES ON SMOOTH SURFACES.

In the paper in 1891 Dr. Black spoke of extension as applied to natural defects as generally recognized and practiced by the careful operator in the profession at that time. Still, it may be well to recall the conditions as shown by the microscope in grooves and fissures as an illustration of the conditions which make this extension necessary. If we take teeth showing fairly well-closed grooves on the occlusal surface and make sections through them, the imperfection in the union of the enamel plates will be surprising. If decay has reached the dentin at one point in the fissure it must be cut

out to the end of the fissure, or such defects will be left along the side of the filling material where the filling stops—often reaching half or two-thirds the distance to the dento-enamel junction. Such a condition may stand, if there be a systemic immunity in the mouth; but if a condition of liability occur, there is a natural opportunity left for the recurrence of attack.

These conditions, then, lead to the general statement that grooves and fissures should be cut out to their ends, or until a smooth margin can be formed. When this is not done and a defect is left forming one of the boundaries of the filling, and if caries occur, it begins in the depth of the defect, and may not show upon the surface until the enamel begins to cave in. For this reason such fillings are very deceptive, and we can recall many cases from practice where we may have hesitated about removing an old filling, the defect scarcely seeming to justify it, but on removal the entire filling is found undermined and there is extensive decay in the dentin. If neglected, the whole crown might have been destroyed before the enamel would have caved in. In these positions the reason for extension is entirely because of the imperfect structure, for there would be no beginning of caries if the surface were smooth enough to prevent lodgment and retention of decomposing food.

It is the second class of attacks, those beginning upon smooth surfaces, which specially demand our attention under the head of "extension for prevention."

Of the smooth surfaces the buccal or labial and the approximal are the ones which are subject to attack, caries on the lingual surface, except in structural defects, being very rare and occurring in exceptional conditions.

AREAS OF IMMUNITY AND LIABILITY.

Before studying the appearances of superficial decay on the axial surfaces, and the conditions which modify the position and shape of the areas of attack, I want to call attention to the importance of the angles of the axial surfaces as the

areas of greatest immunity, that is, the area stretching from occlusal to gingival at the union of the mesial and buccal, distal and buccal, distal and lingual, and mesial and lingual surfaces. Dr. Black called attention very strongly to these areas, as those upon which caries least often occur, in a paper read in February at St. Paul. He said that in the examination of over eight thousand mouths of those under thirty years of age, there were but five cases where caries beginning on one surface had spread superficially across the angle on to the adjoining surface. In regard to this he said, "Hence, as the lines of enamel margins approach these angles of the teeth they approach lines of safety. Whenever they overstep these lines they have overstepped the lines of safety and have approached areas of increasing danger; this is especially true of all buccal and labial surfaces. . . . Therefore any cutting over these lines on the labial surfaces of incisors, or the buccal surfaces of bicuspid and molars, making fillings that are in bad taste from the esthetic point of view, are oversteppings of the rules of 'extension for prevention.'" This is intended as a warning to those who are inclined to overstep all bounds in extension.

The second area of immunity to be constantly remembered is the portion of the tissue covered by healthy gum. These two are the most positive regions of safety and even in cases of the greatest liability can usually be counted upon provided the fillings are properly made and finished and the patient can be made to properly chew food. They are of the greatest importance and must be constantly remembered in treating caries on all axial surfaces.

On the buccal surfaces of molars and bicuspid the area of liability is bounded on the mesial and distal by the axial line angles, on the gingival by the gum margin, and on the occlusal by the point of greatest convexity of the surface, or the point from which food in passing over the surface jumps from the surface of the tooth to the surface of the gum. The point of greatest intensity is usually about the middle of the surface mesio-

distally, and the extent will depend upon the degree of liability, which is judged by the appearance of the surface and the general conditions—which are the indications as to the degree of extension necessary.

SYSTEMATIC TREATMENT OF CARIES.

The first step in the treatment of caries on any surface is the cleaning of that surface and the observation of the nature and extent of the superficial attack, on the character of which depends the extent of cutting. This must be judged not only in the light of the individual case but of the operator's entire experience, and in this we must not neglect to consider the changes which occur in the areas of liability at different times. For instance, on the buccal surface of the lower molars in patients of thirteen or fourteen years of age we very often find an area of corrosion just occlusally from the gum margin, with a point of greatest intensity lying about the mesio-distal center of the buccal surface and often corresponding in position to the buccal pit, at which point the enamel is often penetrated. In preparing such a cavity for filling we may not be called upon to cut out the entire extent of superficial attack as indicated by the white lines stretching away to mesial and distal. For as soon as this tooth reaches its full length these lines will be carried into areas of comparative immunity and the disintegration of tissue will stop. As the tooth erupts and the gum recedes, then, the area of liability is carried farther to the gingival.

On the labial surface of incisors and cuspids we have the same general conditions. When caries occurs it is either in a natural defect or just occlusally from the gum margin, extending in a crescent form following the curve of the gum margin, the occlusal boundary of the area being the last point at which food exerts friction upon the tooth in mastication, or at which the lip rubs over the surface with sufficient force to keep it clean. The point of greatest intensity is generally just under the line of greatest convexity

of the surface, which is usually the center of the surface from mesial to distal in cuspids, but is often a little to mesial or distal of the central line in incisors. This point of greatest intensity is often modified by rotations of the teeth which cause food to pass over the surfaces in a slightly unusual manner.

IN YOUNG PEOPLE.

In young people of great susceptibility we sometimes find labial cavities in the middle third of the surface, which appear while the tooth is in the process of eruption, while the gingival third is still covered by the gum. These call for great vigilance but not great extension, for the area of liability will leave the margin in safe positions when the tooth has reached its full eruption. Unless these cases are watched very carefully the tissue will be destroyed as the area of liability passes over it. Cavities in the gingival third, however, must be extended so as to leave the margin permanently under the gum margin, and must be so finished that the tissue will remain healthy and covering it, for if it recedes so as to leave the margin exposed, a new area of liability will appear between the margin of the filling and the gum. The importance of perfect finishing and polishing cannot be overestimated in these positions, and it is often very difficult to accomplish.

On the approximal surfaces the conditions are complicated by the presence of the approximating tooth. These surfaces are best considered in two groups—the incisors and canines in one; the molars and bicuspid in the other.

In the incisors and cuspids the area of liability is roughly triangular, extending from the contact point toward the labio-gingival angle in a fairly straight line, from the contact point to the linguo-gingival angle in the same way, and bounded gingivally by a curved line just occlusally from the gum margin. The point of greatest intensity is toward the gingival from the contact point. The size of the area depends upon the age and the degree of liability. In general the area

increases with age and the moving of the gum margin gingivally and the intensity in the area decreases. In all approximal surfaces the typical areas may be modified by abnormal or exceptional relations of the approximating teeth. The difference in intensity of attack between the point toward the gingival from the contact and the rest of the area is usually very considerable, and much greater than in the case of buccal and labial areas. Penetration, therefore, almost always occurs at this point, but this may be located very close to the incisal edge, or it may be in the occlusal half of the middle third of the surface. When these cases present for treatment the area of broken-down enamel is almost always nearly circular, but if the surface of the tooth is cleaned and polished, whitened areas of enamel will be seen extending to labio-gingival and linguo-gingival from the border of the cavity. These areas should be included in the cavity, or the surface attack continuing in these directions will lead to the formation of a new cavity in these positions at the margin of the old one. It must be remembered, too, that the area will extend farther to the gingival in the future; so that, especially in young people, the gingival wall must be carried beyond the point of surface attack toward the gingival. The gingival wall should be made flat, at right angles to the axis of the tooth, extending from the farthest point of attack at the labio-gingival to the similar point at the linguo-gingival, which will carry it well under the gum margin across the approximal surface. In building the filling it is often necessary to modify the contour in such a way as to bring the contact point a little to the gingival of the incisal margin, and avoid having the incisal margin pass through the contact point. Extension for prevention does not call for carrying the labial margin around the angle on to the labial surface, bringing the gold into view.

The conditions on the approximal surfaces of the bicuspid and molars are the most complicated and at the same time the most interesting, and in these posi-

tions we most often see disastrous results from a neglect to comply with the conditions. The area of liability in bicuspid and molars is roughly oval in form. The occlusal border passes through the contact point horizontally and out into the embrasures in a curve, running toward the bucco-gingival and linguo-gingival angles of the surfaces in a curve and following the outline of the gum margin across the approximal surface. The bucco-lingual diameter of the area is usually greater than the ocluso-gingival, and the point of greatest intensity is represented by a small oval just to the gingival of the contact point. It is at this point that penetration occurs oftenest in young people. The size of the area of liability is increased in proportion as the area of contact is broad and as the teeth are short from occlusal to gingival, because of the greater tendency to the retention of food and the protection of microbic plaques around the area of contact. The treatment of these conditions requires the increase of the mesio-distal diameter of the tooth, increasing the interproximal space, narrowing of the contact point and increasing the width of the embrasure. From youth to middle age the extent of the area increases bucco-gingivally and linguo-gingivally, though the intensity decreases, if the form of the contact and the interproximal space be maintained. This requires an extension gingivally of the gingival wall beyond the limits of superficial attack for young people, which consists in a squaring out of the gingival corners, following and passing the indications of superficial attack.

In the treatment of caries of approximal surfaces of bicuspid and molars, "extension for prevention" is useless unless the proper form of contact and interproximal space be restored, and they had better not be extended unless the fillings

are properly made and properly finished and polished.

IN PERSONS OF MIDDLE AGE AND OLDER.

In persons of middle age and older there is another form of decay on approximal surfaces caused by the flattening of approximal contacts by the wear of badly contoured fillings in the adjoining tooth. In this class of cavities decay occurs much farther to the gingival, often at the gingival line, producing very ugly cavities. These call, not for extension for prevention, but for restoration of self-cleansing contacts. This can only be done by slow or repeated separation and the building of properly contoured fillings.

In the consideration of this subject caries is treated as primarily a disease of youth. It does not consider the forms of decay usually associated with cachectic conditions in old people.

In closing I simply want to say that "extension for prevention" should never be followed empirically, by rules to cut to here or to cut to there, but based upon a study of the conditions of beginning decay of the enamel, especially as manifested by superficial corrosion of the surfaces of the teeth, and the cavity margins placed in positions and under conditions that will be least liable to recurrence of decay. We cannot do better than take the example of the father of the expression, who takes just pride in the number of mouths of which he can say, "I cared for them from youth through middle age, and they never lost a tooth and never lost a filling." To accomplish such things requires careful study of conditions in the mouth, skilful manipulation, and a sympathy of heart—qualities possessed by few to a higher degree than by the author of "extension for prevention," Dr. G. V. Black.

COLLEGES: THEIR RELATION TO THE PROFESSION.

By J. A. CHAPPLE, D.D.S., Atlanta, Ga.

(Read at a "smoker" given by the dentists of Macon, Ga., to the Georgia State Dental Association, June 12, 1902.)

MR. TOASTMASTER AND GENTLEMEN: Tallyrand said, "Language was designed to conceal our thoughts." In his time, when duplicity, intrigue, and insincerity marked the diplomacy of every premier, this was no mean definition. But in this very practical age, when by the general dissemination of knowledge through the medium of the press and other equally potent factors the average intelligence of the masses has been greatly enhanced as compared with what it was in Talleyrand's day, in dealing with stern facts and figures, flowers of speech have no place.

In the limitations of the hour, and with the desire to be entirely frank and impartial, I shall invoke the eloquence and infallibility of that branch of science which declares that "figures do not lie"!

THE COLLEGES.

What of the colleges? Thank God, when the University of Maryland declined to adopt Chapin Harris' suggestion that a chair of dentistry be established in that school, it unwittingly gave birth to a new profession which has encircled the globe. To this blunder in 1839 we are greatly indebted. Finding no godfather to stand sponsor for the child, the foundling, with scant patronage and equally scant encouragement, soon merged forth into the vigor of an irrepressible young manhood. And who among us could wish that the Baltimore College of Dental Surgery had died *in utero*? Who among us but rejoice at the fact that it had its birth in good old Southern soil, and that it still lives? Keeping step with the march of material

progress and civilization, dentistry has today in the United States 54 dental colleges, with an attendance of 7928 students.

Don't let your enthusiasm, like Bob Acres' courage, ooze out at your fingertips at this apparently formidable array of figures. To allay any serious apprehension on your part, I may add in passing that of this number of students, 160 were women. While the aggregate number of students may be regarded as exceeding the requirements of the population, in comparison with the number of students of other closely allied professions, the dental schools are entitled to a still farther increased attendance. It is often by analogy we arrive at the truth. In 1900, there were in the United States 151 medical colleges, with an attendance of 25,110 students; 96 law colleges, with 12,516 students; and, as above stated, 54 dental colleges, with 7928 students; making 17,182 more medical students, and 4588 more legal students, than dental students.

Computing the population at 70,000,000, this is one law student to every 5573 inhabitants; one medical student to every 2787 inhabitants; and one dental student to every 8800 of the population.

This ratio of the number of students to population is approximately the same as is the number of practitioners to population. Hence, when it is remembered that every inhabitant does not require the constant or even casual services of a lawyer or a physician, but that ninety-nine out of every one hundred do require dental attention, how can the charge be reasonably sustained that "too many

students are seeking entrance into the profession”?

There is no disguising the fact that the colleges are held responsible for the number of students studying dentistry. This is dogmatically proclaimed without one scintilla of proof, wherever the subject is discussed. At St. Augustine, in 1898, I said the profession at large, and not the colleges, was responsible for the number of students in the schools. With additional statistics at my disposal, I reiterate the charge with double emphasis. Of the 49 states and territories, including the Hawaiian Islands, who have enacted dental laws, 37 require the applicant for license to practice to present a diploma. If it be seriously desired to check the attendance in colleges, you have the unquestioned right to do so by so amending the present laws, and to *ignore* the diploma requirement and substitute for a college course a three years’ tuition in a private office, with all the emoluments, “rights and privileges appertaining thereto.” But aside from the compulsory feature of the dental laws, which was placed there by the profession at large and not by the colleges, other influences, outside of the schools, have contributed unwittingly to an increased interest in dental science and a corresponding enrollment at the colleges.

The first and foremost factor as a cause of the almost phenomenal growth of the schools is the overcrowded condition of other professions. The large and increasing army of briefless attorneys—who seem to exist upon wind and water—and the meager support realized by the average physician, are reasons quite sufficient to deter the man who seeks a profession not alone for the dignity of the name, but from remunerative considerations as well.

But perhaps the most potent factor to be reckoned with as attracting students to the profession is crown and bridge work—dental jewelry, if you please—the indiscriminate use of which has prostituted the dignity of the profession and placed a premium upon dishonesty. The comparatively large fees for bridge work have been most seductive; and when the

student, for the first time, crosses the threshold of a college, his first ambition is, not to become conversant with the principles involved in ordinary practice, but to solve what are to him the profound and fascinating mysteries of crown and bridge work!

That there are “good, bad, and indifferent” schools of dentistry is not denied. That there are a few which could and should forfeit their charters *pro bono publico* is a fact and a consummation devoutly to be wished. But cannot the same be said of schools of every branch of science and trade?

A college of any character presupposes a large and varied literature, and this leads us to inquire who are the authors of our text-books? With scarcely a single exception they are men in active college work today. Take from our literature the products of Chapin Harris, Gorgas, Taft, Garretson, Flagg, Kirk, Black, Essig, Marshall, Talbot, Johnson, and Thompson, and you would have no colleges nor literature worthy the name. As for current literature, the exponents of the best thought and highest aim are conducted by college men. Not but that non-college men could have done quite as well, perhaps, but since we are dealing in facts and not fiction, the truth of history, past and present, demands that we state them correctly.

THE RELATION OF THE COLLEGES TO THE PROFESSION.

Responding to the second clause of the toast, I shall endeavor to be equally candid. The history of the antagonism between the National Association of Dental Examiners and the National Association of Dental Faculties, which attracted attention some seven or eight years ago, is still fresh in the minds of all. At that time the relation between the schools and the profession was most strained, threatening a most bitter warfare. But in every great crisis of a national or international character, wise counsels usually prevail. Be it said, therefore, to the credit of the profession at large, that conservative action marked the final ad-

judication of all differences, and sweet peace now reigns throughout our ranks. We are not unmindful or indifferent, however, to the still further fact that while there are now no *open* ruptures between the colleges and the profession, candor compels the admission that there is an undercurrent of feeling against colleges as a whole, predicated upon the assumption that the schools are graduating incompetent and unethical men. Time will not admit of an elaborate defense or explanation of these charges.

As to "incompetency," in isolated instances this is true. The student *in theory* fulfills in the highest degree every reasonable requirement in making his percentage. In practical work, knowing full well his graduation depends upon the amount of skill shown, he exerts himself to his utmost, with a fairly creditable result. Then again, there is a class of men who, were they to attend a college for twenty years, would show at the expiration of that time no greater aptitude than when first they entered; but, having complied with every essential requirement, they are turned over to the tender compassion of the examining boards, assurance being felt that should they succeed in securing a license, such men will sooner or later gravitate to the bottom, and eventually throw up the sponge. But dental colleges, in their attitude toward such class, are not exceptions. In every literary college, every medical college, and every law college—not to mention all others—men and women are annually graduated with the full knowledge of the faculties that, while meeting the technical demands of the curriculum, they will appear in after life as only one star in the "milky way," and not as a planet from whom the countless mariners upon the great trackless ocean of life may safely take their bearings.

When technological colleges, business colleges, and those already referred to, cease to send forth "incompetent" men, the infallibility of all human effort will have been attained and the acme of perfection realized!

As to the charge of turning out "unethical" men, it is not true. The commercial spirit may dominate the mind of the student while pursuing his studies; but he is quite careful to conceal it, and hence his intentions are never known to the faculties. Dental colleges are no more responsible for the "unethical" conduct of their alumni than are theological or legal colleges responsible for the unethical deportment of their students.

The colleges sincerely share with the profession its annoyance and disgust with this parasite, and will cordially co-operate with it in any scheme that will effectually exterminate it from our ranks.

I may observe just here that to instill principles of right conduct into students, one college at least has required the senior class to sign the code of ethics, a facsimile of such signatures appearing in its annual announcements.

With the adoption of a four-year course the number of students entering colleges will no doubt be less than at present; but the loss, numerically, will surely have its compensation in a higher intelligence, and an improved intellectuality will bring with it a corresponding regard for all that contributes to the mutual welfare of all mankind. When colleges shall work in harmony with the profession, and the profession cease to regard the colleges with undue suspicion but accord them its moral support, the "relation of the colleges to the profession" will prove, indeed, an ideal one, typifying that millennial condition of all things when the "lion and the lamb shall lie down together."

PROCEEDINGS OF SOCIETIES.

“F. D. I.”

INTERNATIONAL DENTAL FEDERATION.

Fourth Annual Session: St. Louis, Mo., August 1904.

THE International Dental Federation convened on Friday, August 26, 1904, in Music Hall, Coliseum Building, St. Louis, Mo.

The meeting was called to order by the president, Dr. CHARLES GODON, Paris.

He introduced Dr. WILLIAM CONRAD, St. Louis, who delivered the welcoming address on behalf of the dental profession of the state of Missouri and of the city of St. Louis. To his hospitable and fraternal remarks,

The chairman, Dr. GODON, responded as follows:

Members of the International Dental Federation, ladies and gentlemen: The first thought I wish to express here on behalf of the International Dental Federation is one of admiration for your great nation, your mighty republic, to which are bound by so many ties of sympathy and gratitude all citizens the admirers of liberty, progress, and civilization. Your magnificent Exhibition constitutes a new proof of the progressive genius of the American nation and deserves a leading place among the accomplishments of human activity. We acknowledge a debt of gratitude to the American dental profession, to which modern dentistry owes so much, and to its most eminent representative members who are here with us.

Hail to the members of the dental profession throughout the world who so kindly responded to our invitation, and who are now with us as members of the Executive Council. While speaking of

these devoted fellow workers in this great international task, let us not forget those who, because of unavoidable circumstances, are prevented from being with us at this time, likewise those who have left us forever.

Today we inaugurate in St. Louis the session that finishes the work of the first period of the F. D. I. We shall soon have to report to the Fourth International Dental Congress upon the mission entrusted to us by the Third International Dental Congress, and will turn over to it our powers.

I shall not attempt to make a long report of the work of our body during that period of four years. That is the duty of our general secretary and devoted co-laborer, Dr. E. Sauvez, who has from the beginning worked indefatigably for the benefit of the cause. I only wish to recall to your minds the principal phases through which the F. D. I. has passed in its first period of existence. It originated in Paris, in 1900, through the enthusiasm of the twelve hundred congressists from every corner of the globe. It uttered its first lisps in Cambridge the following year—in that old English university, under the presidency of the eminent professor of physiology, Sir Michael Foster, who then determined the real philosophy of education as related to dental training, defining and limiting the sphere of influence of the F. D. I. in order to make of it a great international advisory council of dentistry. The next meeting took place in Stockholm, where, in the midst of discussions which had in

view the planning of an international dental curriculum and the determining of the best conditions under which public dental services should be carried out for the greatest and most effective benefits to suffering humanity, it was decided that it should be in St. Louis that the Fourth International Dental Congress should be held. From that decision ensued a long, feverish, and fruitful contention about the interpretation to be given to the powers of the Federation or its representative members, and about the conditions of its participation in different kinds of professional movements. That discussion lasted over two years, and the session of Madrid in 1903 was almost exclusively devoted to it.

I have said feverish, inasmuch as it has caused deep discussions in our profession, especially in the United States, and fruitful also, because thus its existence has been made manifest to every one, and its importance as a factor in proceedings of a professional nature has been made equally evident.

We have therefore been enabled to prepare a set of rules and regulations, which, when confirmed by the next Congress, will assure, I hope, the success of its future work.

In this, the twentieth century, these international federations constitute a new organism necessary not only to dentistry, but to all departments of professional and scientific activity. When men thus meet in great peaceful sessions and in universal expositions and congresses, wholly given up to the pleasure of exchanging ideas and of communicating the result of their works and investigations, they must forget political and geographical limits and think only of the greatest good that may be derived for the benefit of all, regardless of nationality or local susceptibilities.

As new agents in the development of progress in civilization these great federations do not interfere with national questions, for those remain under the safe keeping of political and diplomatic bodies; but their activities take place on the high plane of human science, where territorial divisions have no effect, where the end

can be only peaceful because the contests are only of the intellect, and where the presiding goddess is like the statue of Liberty in the harbor of New York, having in one hand the torch of truth, and in the other the olive branch—both symbols of true human fraternity.

The President then called on Dr. C. C. CHITTENDEN, Madison, Wis., president of the National Dental Association, who in a few appropriate words expressed his admiration for the work and purposes of the F. D. I.

Dr. H. A. SMITH, Cincinnati, Ohio, was the next speaker. He made a short address in which he referred to the far-reaching influence of the Federation's work and to his pleasure and satisfaction that such an eminent body of men should meet upon American soil.

Dr. Godon then called on

Dr. SAUVEZ, the secretary-general, who read an able and carefully prepared report, in which he reviewed the work of the F. D. I. from its organization to the present time.

After the reading of the secretary's annual report,

Addresses were made by Dr. JOSÉ J. ROJO, Mexico; Dr. VINCENZO GUERINI, Italy; Dr. FLORESTAN AGUILAR, Spain; Dr. ALFRED BURNE, Australia; Dr. JOHN GREVERS, Holland; Dr. L. C. BRYAN, Switzerland; Dr. N. S. JENKINS, Germany; Dr. R. B. WEISER, Austria; Dr. J. Y. CRAWFORD, Nashville, Tenn.; Dr. J. D. PATTERSON, Kansas City, Mo.; Dr. H. B. TILESTON, Louisville, Ky., and Dr. J. J. REID, president of the National Association of Dental Examiners.

In the afternoon the several commissions which together constitute the International Dental Federation held separate sessions in the same building. The deliberations of the International Commission of Education were presided over by Dr. Truman W. Brophy, Chicago; those of the International Commission of Hygiene and Public Dental Service by Dr. N. S. Jenkins, Dresden, Germany; those of the Commission on International Den-

tal Press by Dr. A. W. Harlan, New York, in the absence of the regular chairman, Dr. Elof Förberg, Stockholm, Sweden.

At the afternoon sessions and at those held on the following day papers were presented and read before the respective commissions—by Dr. CHARLES GODON, on "Dental Education in France"; by Dr. WM. MITCHELL of London on "Technical Education"; by Dr. W. E. BOARDMAN, Boston, on "The Necessity for Establishing Libraries in Dental Schools"; by Dr. C. N. JOHNSON, Chicago, Ill., "A Brief Consideration of the Grading of Students in Dental Colleges"; by Dr. H. L. BANZHAF, Milwaukee, Wis., on "International Dental Education"; by Dr. A. H. THOMPSON, Topeka, Kan., on "The Development of Dental Education in the West"; by Dr. GORDON WHITE, Nashville, Tenn., on "The Present Status of Dental Education in the United States"; by Dr. R. B. WEISER, Vienna, Austria, on "Education"; by Dr. CHARLES GODON, on "Emergency Dentistry and Complete Dentistry for the Poor"; by Dr. BURTON LEE THORPE, St. Louis, Mo., on "The American Journal of Dental Science and its Influence"; and by Dr. J. ENDELMAN, Philadelphia, Pa., on the "International Federation Bulletin."

The Executive Council held several business meetings, and at the last one held in the Coliseum Building on Saturday, September 3d, prior to the closing

of the Congress the following officers were elected:

Hon. President—Chas. Godon, Paris.

President—W. D. Miller, Berlin.

First Vice-President—Emile Sauvez, Paris.

Second Vice-president—R. B. Weiser, Vienna.

Third Vice-president (to be elected by the British Dental Association).

Secretary-general—Edward C. Kirk, Philadelphia.

Assist. Secretaries:—Schaeffer-Stuckert, Frankfort; Paul Guye, Geneva, and Burton Lee Thorpe, St. Louis.

Treasurer—Florestan Aguilar, Madrid.

The present Executive Council is composed of fifty members, each country affiliated to the Federation being represented by a number of members varying from one as the minimum to five as the maximum.

The present representatives of the United States, five in number, were elected by the National Dental Association at its meeting held in the Coliseum Building, September 2d. They are—Wm. Carr, New York; B. Holly Smith, Baltimore; Edward C. Kirk, Philadelphia; A. W. Harlan, New York; and Burton Lee Thorpe, St. Louis.

The next meeting of the Federation will be held in Switzerland in 1905, the date and the city to be announced in the near future.

RULES AND REGULATIONS OF THE INTERNATIONAL DENTAL FEDERATION

AS APPROVED BY THE FOURTH INTERNATIONAL DENTAL CONGRESS, AT ST. LOUIS, MO., 1904.

Preamble.

(a) The International Dental Federation is an association or universal union of national dental societies and those affiliated therewith.

(b) The official title adopted is "Fédération Dentaire Internationale," abridged "F. D. I."

(c) The International Dental Federation is a permanent international body existing in the interim between international dental congresses.

(d) It is governed by an Executive Council, composed of delegates representing different countries (receiving appointment from the preceding congress). This Council organizes various Commissions that it deems will be

beneficial to the advancement of dental science in any of its phases; it is at the same time an advisory committee on international affairs.

(e) The F. D. I. will hold a general meeting preceding the opening of each international dental congress.

(f) The Executive Council and the various Commissions will hold annual meetings, the time and place to be selected at the close of each meeting.

(g) *Authority creating the F. D. I.:* Resolutions passed by the Third International Dental Congress (Paris, France), August 14, 1900, viz:

"Resolution 11. There shall be organized an International Federation.

"Resolution 12. The national committees appointed to this Congress will continue in office and will constitute the International Dental Federation."

Rules and Regulations.

ARTICLE I. The INTERNATIONAL DENTAL FEDERATION was organized by the national committees present at the Third International Dental Congress, at Paris, in 1900, and was created in conformity with Resolutions 11 and 12 passed by the general meeting on the closing day of the aforesaid Congress, August 14, 1900.

ART. II. The objects of the Federation are as follows:

(a) The acceptance or rejection of invitations made by various countries to hold a regular International Dental Congress, and to fix the date and place where such congress shall be held;

(b) To maintain and strengthen the ties that bind the National Societies to each other;

(c) The organization of such International Commissions as it may deem necessary to create;

(d) In a general way, to promote the organization of bodies that will contribute to the advancement of odontological science throughout the world.

ART. III. The International Dental Federation consists of—

(a) All the national committees gathered in Paris in 1900, or their successors;

(b) Associations or societies giving their adhesion to international dental congresses, and accepting these Rules and Regulations or sending their concurrence in them;

(c) Societies, or groups of societies, which may officially signify their acquiescence in these Rules and Regulations and which are acceptable to the Executive Council.

ART. IV. National dental associations or societies, or, in the absence of such, persons desiring to become identified with the F. D. I., should send their acceptance of the present Rules and Regulations. Such applications will be acted upon by the Executive Council, who will accept them as members of the Federation.

ART. V. The general meeting of the F. D. I. will take place before the opening of each International Dental Congress. It will be composed of delegates from national or other societies. Extraordinary meetings may be called for special reasons by the Executive Council.

ART. VI. The Executive Council may admit as members of the Federation—

(1) Members regularly appointed by societies;

(2) Honorary members;

(3) Persons in good professional standing who have been members of international dental congresses, and who shall subscribe to these Rules and Regulations.

ART. VII. The program for these meetings will be prepared by the Executive Council. It will deal with matters emanating from national or other societies, or with questions proposed by the Council. Notices will be sent at least one month before these meetings to all affiliated societies, national or local.

ART. VIII. The right of voting pertains to regularly appointed delegates. Upon the request of representatives of at least two national dental associations, the vote may be taken by the said regularly appointed delegates in the mode of one vote for each country.

ART. IX. The annual meetings of the Executive Council, and of the various Commissions, are governed by the preceding Rules and Regulations.

ART. X. The F. D. I. is composed of an Executive Council, as follows:

(1) Fifty original members, chosen by the Congress—that is to say, for each country as a minimum, one member, with a maximum of five members;

(2) In case of vacancy, by resignation, death, or other cause, the Council will ask the respective national dental association to fill the place of the missing member.

(3) The powers of the Executive Council will expire upon the opening of each International Dental Congress.

(4) The Council will hand over to a special committee appointed by the Congress all of its documents and records, at the time of the opening of the Congress, said committee receiving for the same.

(5) The treasurer of the F. D. I. will hold office until his successor is appointed.

ART. XI. The Council is governed by nine Officers, as follows:

- (1) A president;
- (2) Three vice-presidents;
- (3) A secretary-general;
- (4) Three assistant secretaries;
- (5) A treasurer.

The officers of the Council are *ex officio* members of all Commissions, and will direct them until they are properly organized.

ART. XII. The duty of the Executive Council is—

- (a) To supervise the execution of the rules of the Federation;
- (b) To fix the place and date of annual meetings, and of International Dental Congresses;
- (c) To organize various International Commissions;
- (d) To supervise the carrying out of decisions made by the F. D. I.;
- (e) To examine propositions and resolutions offered by national committees, associations, or other societies.

The Council will keep all affiliated bodies informed of their work through the Bulletin of the Executive Council, which will be published in at least four languages, viz, French, German, English, and Spanish.

ART. XIII. The Council has already named several special Commissions, as follows:

- (1) A Commission on Education;
- (2) A Commission on Hygiene and Public Dental Service;
- (3) A Commission on International Dental Press;

And it will organize a Commission on Professional Jurisprudence, Deontology, and Nomenclature.

ART. XIV. The sources of income of the F. D. I. are as follows:

- (1) By dues from the members, to wit:

Members of the Executive Council	
(per year)	\$10.00
Members of Commissions (per	
year)	5.00
Honorary members and all others	
(per year)	5.00

- (2) Appropriations by Congresses.

(3) Subscriptions, gifts from governments or municipalities, from national associations, and from individuals.

ART. XV. In case of deficit, the expenses of the F. D. I. shall be provided for by equal assessment on all societies having membership. Any excess above the receipts will be turned over to the next Dental Congress. The Council will give a detailed statement of receipts and expenditures to every Congress.

ART. XVI. The Executive Council will send to the Congress during its sessions a list of those members best qualified to carry on the international work of the F. D. I.

ART. XVII:

(1) International Dental Congresses shall be organized by a committee composed of dentists, who shall be chosen as follows:

One-third of its membership shall be appointed by the Executive Council of the F. D. I.; the other two-thirds shall be appointed by the inviting dental bodies. The committee so composed shall constitute the Committee of Organization, all the members of which shall have the same powers.

(2) At the first meeting of the Committee of Organization they shall organize and select the following officers of the committee:

- One president;
- Two vice-presidents;
- One secretary-general;
- One treasurer.

(3) The Executive Council of the F. D. I. has full power to decide all questions in dispute arising in the Committee of Organization.

ART. XVIII. These Rules are operative during the periods between regular Congresses. They are subject to revision by the succeeding Congress.

**FOURTH INTERNATIONAL DENTAL CONGRESS, ST. LOUIS, MO.,
August 29 to September 3, 1904.**

Opening Session—Monday, August 29, 1904.

THE first general session was called to order at 11 A.M. Monday, August 29th, by Hon. Howard J. Rogers, director of congresses of the Universal Exposition.

Rev. H. H. GREGG, St. Louis, invoked divine blessings on the deliberations of the congress.

Hon. HOWARD J. ROGERS, in opening the congress, and welcoming the members on behalf of the Universal Exposition, spoke as follows:

Members of the Fourth International Dental Congress, ladies and gentlemen: It gives me great pleasure on the part of the Universal Exposition to welcome you to this city today. To the members of the International Dental Federation; to the members of the National Dental Association; to the foreign delegates who are accredited by their respective governments; to the members of the profession, whether in this country or abroad, the Exposition extends a most cordial welcome! We are glad to have you with us!

The profession of dentistry has made enormous strides during the past ten years, and our states are engaged at the present time in passing laws which shall govern the entrance to the study of this profession, and improve the college curriculum and govern the entrance to the profession itself. We expect, therefore, that from your sessions this week much of profit will accrue to this and other countries on matters connected with your profession, and we expect from a legislative standpoint to receive valuable advice in framing proper laws for the development of dentistry. We hope, however, from an Exposition standpoint, that you will find time during

your deliberations to visit us at the great Exposition in the western part of the city, which should appeal to you sympathetically because it has been promoted upon educational lines. Our appeal to the government for funds, to foreign governments for co-operation, to the states of the Union for support, has been based upon this plea of education—of course meant in its broadest sense: the education which comes from observing arts and architecture in heroic form; from exhibits as here grouped together with due regard to their interrelation and interdependence, wherein the raw material is taken and under our eyes transposed into the finished article ready for the markets of the world. These exhibits have all been prepared with great expense and care, and we hope that you will avail yourselves of the opportunities there presented. If you are seeking for mental development this week, you will find it, I am sure, in the fifteen large buildings, crowded with the best things from all parts of the world, and from the many state and individual exhibits surrounding them. If you are in search of physical development, you will find it, I am sure, while roaming over the twelve hundred acres comprised in the Exposition grounds. If you are seeking for relaxation and rest, we have to commend you to that paradise of amusement, the pike. All this we extend to you.

A very material part of the development of this Exposition has been a series of congresses and conventions. We have had something like two hundred conventions held under the Exposition auspices. To these we have given every opportunity and attention to make it a satisfactory meeting-place. We have scheduled twenty international congresses connected

with the different sciences and professions, and these will culminate in the latter part of next month in the great Congress of Arts and Science which can be designated as a symposium of the scientific work of the world.

The Fourth International Dental Congress is the third in number of this great series of international congresses. In the organization of these various congresses it has been our policy to work through the national association of this country allied with that specialty, believing that it was best to do so because it would bring the people interested in that science or in that profession closely in touch with its development, and furthermore because we believe that the best interests of the Exposition and of the profession concerned could be promoted simultaneously. For that reason we have worked in your own case through the National Dental Association, and made the committee appointed by that association our Committee of Organization. We have given them every support, believing that they represented the best element of the profession in all parts of the country or else they would not have been certified to us by the National Association.

No one who has not had experience in the development and promotion of a great international congress can have any idea of the amount of work, the amount of time, and the amount of sacrifice necessary to bring it to a consummation. I venture to say that if every member of the Committee of Organization could have known two years ago what they know today of what was required of them in work, money, and effort, hardly one would have been willing to undertake it. It means a great deal of hard work and much criticism. Every committee of organization, however, must have two things fixed before them in order to bring about a successful congress. They must have a program which in strength and timeliness of subjects should be of special interest to the profession. It must also bring together an audience capable of appreciating that program. These two objects must be sought, and I would be remiss in

my duty and profligate of my opportunities if I did not take this occasion on the part of the Exposition to render thanks to the Committee of Organization for the magnificent work they have done since they were appointed. To the chairman, who has looked particularly after the funds and the many and varied details of organization, all of which have been conducted with consummate executive ability; to the secretary, who has conducted a correspondence running into reams and reams of paper; to every member of the Committee of Organization, who has done well and to the best of his ability the particular duty assigned to him—again on the part of the Exposition I express our appreciation of their work.

We come now, gentlemen, to the permanent organization of the Fourth International Dental Congress. Following the procedure which has obtained in all of the other international congresses held under our auspices, we some time ago instructed the Committee of Organization to make a permanent roster of officers to preside over this convention, believing that by so doing we were contributing to the stability of the congress, to the contentment of individuals, and to the permanence of the program, and that we were working for the best interests of the congress. We have found, however, that there is a strong opinion among the members of this convention—whose opinion we most highly respect—that the report of the nominating committee of the Committee of Organization should be submitted to your honorable body for ratification—(applause)—and at the special request of the chairman of the Committee of Organization, Dr. Burkhardt, and at the request, passed in due form, of the committee, we will now rescind that former order, and present to this convention the nominations individually, so that there may be a convincing expression of opinion as to the gentlemen who shall preside over you during the congress.

The question therefore is, What action shall be taken upon the original report of the nominating committee, certified to

us in due form by the Committee of Organization, nominating Dr. H. J. Burkhart for president of the Fourth International Dental Congress?

Dr. B. HOLLY SMITH, Baltimore, Md. Mr. Director, it is more than pleasant for those who have been interested in the organization of this congress to have your public commendation of the work of the organization committee.

Townsend, in a little book entitled "The Art of Speech," quotes from an unknown writer the following: "The ball of discord has been thrown in our midst, and unless it be nipped in the bud it will burst into a conflagration that will deluge the world." Mr. Director, I cite this quotation because it is my personal desire that you should not regard these evidences of contention as a serious matter. It may be that some simple men in this audience may have a ball or two in their pockets, but this ball, if it exist, is not of a kind with which to start a fire, nor, if there should be some little balls of feeling, is there any probability that they will deluge the world and interfere with the work of this congress. I have personally known some of the members of this committee for a number of years; the chairman especially, before he became a practitioner of dentistry. I have known him to be an honorable, upright, conscientious, energetic man in all of his professional work, and I feel that this congress will do itself credit, and do the graceful thing in honoring him who has borne the brunt of the work of organizing this congress; and I therefore move you, Mr. Director, that the action of the nominating committee in nominating him for the presidency of this congress be confirmed, and that Dr. H. J. Burkhart be elected president. (Applause.)

Dr. R. H. HOFHEINZ, Rochester, N. Y. Mr. Director, as a member of the Committee of Organization, of which you have spoken so flatteringly and appreciatively, I take great pleasure in seconding the motion of Dr. Smith that the action of the nominating committee be confirmed, and that Dr. Burkhart be elected the president of the Fourth International Dental Congress.

Mr. ROGERS. The question before the house is, Shall the action of the nominating committee for the presidency of this congress, as recommended by the Committee of Organization, be ratified.

The motion was carried, and Mr. Rogers declared the action of the nominating committee in nominating Dr. Burkhart for president ratified and adopted.

Dr. C. N. JOHNSON, Chicago. Mr. Director, I should like to move that this election be made unanimous.

Mr. Rogers put the motion, and the election of Dr. Burkhart for president was made unanimous.

Dr. Burkhart was escorted to the platform, and Mr. Rogers introduced him as follows: "Gentlemen of the convention, I have the honor to introduce to you your presiding officer, Dr. H. J. Burkhart." (Applause.)

Dr. BURKHART. Gentlemen of the Fourth International Dental Congress, I thank you deeply for this expression of confidence, and for confirming the action of the nominating committee and the work which that committee has tried to do conscientiously and for the best interests of this congress.

The next order of business will be the election of the secretary-general.

Dr. JAMES TRUMAN, Philadelphia, Pa. Mr. President, I wish to nominate for the office of secretary-general Dr. Edward C. Kirk of Philadelphia. (Applause.) I take great pleasure in saying that Dr. Kirk has from the very inception of this movement done a large portion of the work connected with it. By day and by night that gentleman has worked faithfully up to the present moment, and he resigned from the secretary's work simply because he found that the committee had decided to elect the officers of the congress permanently, and because of the fact that his word, which had been sent broadcast over the world, was pledged to the principle that the congress would elect its own officers. He had said that the congress would and should elect its own officers, and therefore he would not allow his name to be used when the time for

electing officers by the Committee of Organization came. Now, the question before you is whether you will elect this man, who has done so much for this congress, or someone else. I have no objection to that someone else, but I do object to allowing an individual who has accomplished so much to be overlooked by the congress. Generally speaking, I do not care personally who the officers of this congress are; that is not my object—my desire is for the advancement of the dental profession scientifically; but I want you to understand that when a man has done all that Dr. Kirk has done for this congress, it is our right and our duty to elect him, and I therefore nominate him for secretary-general of the Fourth International Dental Congress. (Applause.)

Dr. E. T. DARBY, Philadelphia, Pa. Mr. President, it gives me great pleasure to second the nomination which has been made for Dr. Kirk as the secretary-general of the Fourth International Dental Congress. (Applause.)

Dr. G. V. I. BROWN, Milwaukee, Wis. Mr. President, the motion is out of order. The method of procedure begun by Mr. Rogers was that each of these nominations be submitted to the congress for ratification or non-ratification of the action of the Committee of Organization.

Dr. WM. CONRAD, St. Louis, Mo. As a member of the committee which nominated the officers for the Fourth International Dental Congress I would state that we nominated Dr. Burkhardt for president; Dr. Kirk for secretary-general, and Dr. Finley for treasurer. Dr. Kirk resigned his position after being elected, and Dr. A. W. Harlan was elected to take his place. I move, Mr. President, that this congress indorse the action of the nominating committee in nominating Dr. A. W. Harlan for secretary-general.

The motion was seconded by Dr. J. Y. Crawford, Nashville, Tenn.

Dr. Conrad's motion was lost.

Dr. TRUMAN. Mr. President, I now renew my nomination of Dr. E. C. Kirk for secretary-general of the congress.

Dr. WM. CONRAD, St. Louis. I nominate Dr. A. W. Harlan for secretary-general of the congress.

A rising vote was taken on the two nominees, and resulted in the election of Dr. Kirk.

Dr. Kirk was escorted to the stage, and was presented to the audience by the president.

Dr. E. C. KIRK. My friends, I have neither the strength nor nervous energy to at this moment say more than that I thank you from the bottom of my heart for two things: First, for all that this means of personal regard and confidence; and second, that it represents, I believe, the allegiance to the principle which has been so gracefully conceded by the Committee of Organization, namely, the right of every man to express his views upon this question. (Applause.)

The PRESIDENT. The next order of business is the ratification of the action of the nominating committee in nominating Dr. M. F. Finley for treasurer of the Congress.

Dr. WM. CONRAD, St. Louis, Mo. Mr. President, I move that the nomination of Dr. Finley for treasurer be ratified by this body.

The motion was put before the house, and Dr. Finley was duly elected treasurer of the Fourth International Dental Congress.

Dr. Finley was escorted to the platform and introduced by the president as follows: Gentlemen of the Fourth International Dental Congress, I have great pleasure in presenting to you the gentleman who presides over the funds of this congress. (Applause.)

Dr. FINLEY. Mr. President and gentlemen, I would like to be able to thank you as gracefully as has Dr. Kirk, and if you will accept his words for mine, I will thank you.

The President next introduced Dr. C. S. Butler, Buffalo, N. Y., chairman of the Finance Committee, who thanked the members for their hearty co-operation in carrying out the work of his committee.

The President then invited all of the honorary presidents and vice-presidents in the audience to come upon the platform.

The PRESIDENT. Gentlemen and ladies of the convention, I have pleasure in presenting to you my long-time friend and colleague, Dr C. N. Johnson of Chicago.

Dr. JOHNSON. Mr. President and gentlemen of the congress: This is entirely a surprise to me, but I do want to thank most heartily your presiding officer for giving me the pleasure of looking you in the face, and begging you to go to work from this time forward with the one object of making this the best meeting ever held in the history of dentistry. If perchance there has been any feeling developed, let us crush it out and as one man let us all work together to do the best we can for the profession of dentistry.

The PRESIDENT. The Governor of Missouri was invited to make an address of welcome on this occasion, but was unable to be here, and in his absence you will listen to a letter from him, which will be read by the secretary-general.

Dr. KIRK, the secretary-general, then read the following communication from Governor Dockery:

ST. LOUIS, Mo., Aug. 28, 1904.

TO DR. B. L. THORPE.

My dear Sir,—I profoundly regret my inability to be present tomorrow and welcome the delegates to the Fourth International Dental Congress. It would have been a real pleasure for me in behalf of the people of Missouri, to have extended a cordial greeting to this large body of representative and intelligent citizens. Please present to the congress my regrets that official duties prevent my attendance, and also convey my best wishes for a pleasant and instructive occasion.

Your friend,

A. M. DOCKERY.

The PRESIDENT. Ladies and gentlemen, I have the honor of presenting to you the honored president of the National Dental Association, Dr. C. C. Chittenden of Madison, Wis., who will now address you.

Dr. CHITTENDEN. Mr. President, ladies and gentlemen: Great undertakings can only be brought to a successful issue by a careful, well-planned course of procedure and development, controlled by an intelligent comprehension of the objects sought to be attained. Time, patience, and unswerving courage and fidelity—regardless of all personal sacrifice—must be freely thrown into the balance by those who undertake to create and set in motion the machinery required to successfully bring together representative men from all the civilized nations of the earth for the uplifting of a common cause.

Two years ago the National Dental Association, which body I have the honor to officially represent today, received an invitation from the officials of the Louisiana Purchase Exposition to create and put in operation an International Dental Congress, to be held in St. Louis. That invitation was accepted, and a commission of fifteen was appointed to the arduous undertaking. The work was taken up by that commission, and despite the thousand difficulties and obstacles that beset the way—some of them apparently impregnable as Gibraltar itself—the result of its labors stands before us today in the form of a noble, completed, symmetrical achievement—the Fourth International Dental Congress.

Too much cannot be said in appreciation of the untiring labor and self-sacrifice through which this result has been brought about. On behalf of the National Dental Association I here publicly thank the commission of fifteen collectively and individually for their faithful performance of the duties set them.

This congress, whose opening we are met to celebrate, could not have been made possible but for the never-failing guidance, counsel, and (when needed) authoritative direction of a master mind in the person of the director of congresses, Mr. Howard J. Rogers, to whom each one of us here owes a deep debt of gratitude.

The deep interest created in this enterprise throughout the countries of the world is clearly evidenced by the presence

here today of eminent, illustrious representatives and large delegations of dentists from practically every civilized nation of the earth. On behalf of the National Dental Association I extend to these professional brothers gathered under this roof from the very ends of the earth, seeking the development of scientific light and knowledge in their chosen calling,—to all these I extend the hand-clasp of greeting and warmest words of welcome.

Under the skilled business management of the Finance Committee there is every reason to expect that this congress will present a happy contrast, as to its final solvency, to most such undertakings. An ample equipment for each of the sections has been assured.

Finally, to all who have in any way contributed to the success of this great enterprise I here offer the sincere thanks of the National Dental Association. (Applause.)

The PRESIDENT. The address of welcome on behalf of the dental profession of the state of Missouri will be delivered by the gentleman to whom, I believe, belongs the credit of discovering this congress. I take great pleasure in introducing to you Dr. Burton Lee Thorpe of St. Louis, Mo. (Applause.)

ADDRESS OF WELCOME ON BEHALF OF THE DENTAL PROFESSION OF MISSOURI.

Mr. President, and Members of the Fourth International Dental Congress: Proud to be an American citizen, prouder still to be an American dentist, and to have aided in a humble way to make it possible for this great meeting to be held, this is the happiest opportunity of my professional career—to be delegated the very delightful duty of bidding you a most cordial and sincere welcome on behalf of the profession of the state of Missouri and the city of St. Louis.

Recognizing that each of you, delegates coming from foreign countries and the states, territories, and provinces of North America, represents the best interests of the profession of your various localities, and that each of you has contributed

either to the science, art, or literature of dentistry, I am frank to confess that the profession of Missouri feels highly honored to greet and welcome such a distinguished body of representative men and women of the dental profession.

It is fitting, indeed, that during the great Universal Exposition now in progress at the western portals of our city, that is held in commemoration of that historic event when Napoleon Bonaparte, with a stroke of the pen, signed away and gave to Thomas Jefferson and the American people an empire of which imperial Missouri is the most important state—it is fitting, I say, at this time that there be held, as one of a series of many important educational and scientific congresses, the Fourth International Dental Congress.

It is the spirit of the Exposition to show the achievements of human progress, so aptly illustrated by Mr. Chang Yu Tong, the talented interpreter of China of this congress, in the following sentiment:

Well blessed with man's success, Columbia
fêtes

In festal hall the nations and her states;
From every clime her honored guests have
come,

From far Cathay and Europe's Christendom,
From silver-mantled regions of the poles,
From golden shores where sparkling river
rolls;

Her states, like jewels in a coronet,
Around the hall her loving hands have set.

The wine of friendship bubbles in the glass,
From hand to hand the fragrant roses pass;
The song of thanks is swelled by every tongue,
The nation's hymn is sung by old and young.
Rejoice, Columbia! Lead the gallant van,
And show the world the worth of man as man:
Be thou the champion of the human race,
And break the chains which manhood may
disgrace;

The nations, young and old, to thee resign
The sacred scepter and a task divine.

It is also the spirit of this congress to welcome our professional *confrères* from every civilized country, and to unite with them in comparing the wonderful strides the humane and beneficent profession of dentistry has made by enmassing the in-

vestigators, teachers, journalists, and active progressive practitioners of dental surgery, the recognized leaders in art, science, and technique, to demonstrate both clinically and theoretically the latest and best in odontological science.

We are gratified that in the master minds of two American dental pioneers originated the three most potent factors in dental education—the organization of the first dental college, the first dental journal, and the first dental society that brought our calling out of chaos, and made it blossom from a trade into a profession. We know that yesterday's achievements are not forgotten in the onward movement of today, when all nations in reverential homage do honor to the memory of the progenitors of dental science—Horace H. Hayden and Chapin A. Harris.

We are not unmindful, however, of the achievements of the stanch pioneers of Europe, to whom we also must give ample credit for their contributions to our profession.

One hundred years ago, when St. Louis was a frontier trading-post on the banks of yonder river, records say that the first regular dental practitioner was Dr. Paul, a Frenchman of New Orleans, who located here in 1809, soon to be followed by other pioneers, such as Isaiah Forbes, B. B. Brown, Edward Hale, Sr., A. M. Leslie, Isaac Comstock, Aaron Blake, J. S. Clark, H. E. Peebles, C. W. Spaulding, Henry Barron, Homer Judd, C. W. Rivers, Henry S. Chase, Wm. H. Eames, Edgar Park, Wm. N. Morrison, and lastly our distinguished Henry J. McKellops, whose names will ever illumine the pages of Missouri dental history.

This coterie of men stood for progress, and were foremost in city, state, and national dental affairs, and I thank God that the better element of their successors are also imbued with the same progressive spirit, which is proved by their loyalty and liberality in making this congress a success. On behalf of these self-sacrificing, broad-minded, liberal-spirited dentists of St. Louis and Missouri, I welcome you!

We welcome all nations. We welcome

you of Spain, whose generous Queen Isabella long ago equipped the fleet that brought Columbus on his voyage of discovery to our shores. Our hearts also go out to you for the courteous and chivalrous treatment tendered our sailors while the captives of your gallant Admiral Cervera at Santiago.

To you, sons of England, the mother of America: We bid you welcome! Once we were your unruly child; you tried to chastise us, but we had outgrown our swaddling-clothes—you failed; but now the British lion and the American eagle are bosom companions. We heartily appreciate the recognition England has granted that distinguished scientist, our fellow countryman, J. Leon Williams.

To Sweden, who gave us Ericsson, and to Norway, who gave us so many of your sturdy sons and fair daughters who have by their industry made parts of America blossom as a garden: We bid you welcome!

To France, who in the dark days of the American revolution sent us the gallant Marquis de Lafayette and Count Rochambeau and their thousands of fellow patriots who did so much to aid us to gain our independence, we are especially indebted. With these generals of army and navy came two men who have left their imprint indelibly stamped on American dentistry—Joseph Françoise Lemaire and James Gardette, distinguished as skilled operators, contributors to dental literature, and the pioneers in introducing dental surgery in America: We welcome you!

To Germany, whose countrymen have done so much in developing America and have made such excellent citizens: We bid you welcome! and we thank you for the fraternal recognition you have given those two distinguished American practitioners who are the foremost in the world in their specialties—W. D. Miller and N. S. Jenkins.

Lord Bacon says, "Every man owes a debt to his profession," and we feel that you who speak in different tongues, who have crossed the seas to attend this congress, have at least in part liquidated your indebtedness to the profession.

To all nations: to all members of the Fourth International Dental Congress: We bow our heads in salute to you; we bid you welcome from the bottom of our hearts! Our homes are open to you, our hands are at your service. We recognize the fact that you represent the intellect and flower of dentistry of the world, and the profession of Missouri and of St. Louis are flattered to have you here. It is our hope that you may reap untold benefit from this historic meeting, and when you return to your respective homes, may you carry pleasant memories of our people, state, and city; and when your life's work is ended, may you each realize the reward that Kipling so beautifully pictures as the heaven of the honest workingman as symbolized by the painter:

When earth's last picture is painted and the tubes are twisted and dried,
When the brightest colors have faded, and the youngest critic has died,
We shall rest, and faith! we shall need it—lie down for an æon or two,
Till the Master of all good workmen shall put us to work anew.

And those who were good shall be happy:
They shall sit in a golden chair;
They shall splash at ten-league canvas with brushes of comet's hair;
They shall find real saints to draw from—Magdalene, Peter, and Paul;
They shall work for an age at a sitting, and never be tired at all!

And only the Master shall praise us, and only the Master shall blame;
And no one shall work for money, and no one shall work for fame;
But each for the joy of working, and each in his separate star
Shall draw the Thing-as-he-sees-it, for the God of Things-as-they-are!

The PRESIDENT. I now have pleasure in presenting to you the vice-president for America of the International Dental Federation, who will welcome the foreign delegates to the Fourth International Dental Congress.

Dr. A. W. HARLAN of New York then delivered the following address:

ADDRESS OF WELCOME TO THE FOREIGN DELEGATES.

Mr. President, ladies and gentlemen, and Members of the Congress from foreign countries: I am indeed fortunate to be able this day to greet you as the official mouthpiece of the Committee of Organization of this congress. It looked for a long time as though the Fédération Dentaire Internationale and the committee could not come together, but today all differences are settled, and we appear before you as a united profession.

The World's Dental Congresses have become fixed institutions in the same way that other congresses have been evolved. The profession needed congresses. The world would be benefited in consequence of their evolution, and we have them. They are a part of our armament, just as physiology and chemistry are a part of the education of the dentist.

The members of our profession in the United States having chosen me to extend to everyone present from a foreign shore the right hand of fellowship, I give you a cordial fraternal welcome in this noble hall and in the presence of this multitude of our own people.

This is the second time in the history of our profession that an international dental congress has been convened in the United States—1893 and 1904. The origin of dental congresses, as you well know, was in the land of Ambroise Paré, Roux, Fauchard, Jourdain, Lefoulon, Robin, Magitot, Paul Dubois, Lecaudey, and Godon. It is our hope and wish that everyone here this day will feel that he is thrice welcome to participate in the program of the week, and that all will feel that time and distance will count as nothing when they sum up the benefits derived from what they see and hear.

On behalf of the officers and the management of the congress, and the united dental profession, I again bid you all a hearty welcome.

(To be continued.)

NEW YORK ODONTOLOGICAL SOCIETY

Monthly Meeting, April 1904.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, April 19, 1904, at the New York Academy of Medicine, No. 17 West Forty-third street, New York city, the president, Dr. Hart, occupying the chair.

The secretary read the minutes of the last meeting, which on motion were accepted as read.

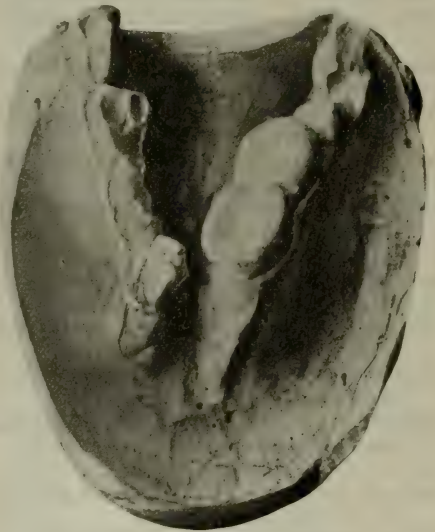
INCIDENTS OF OFFICE PRACTICE.

Dr. H. P. GOULD. I would like to present the case of a woman from Trinidad, British West Indies. She was shot in a riot there some ten months ago. About eight months afterward she came here for treatment. The mandible anterior to the second bicuspid on one side and the first molar on the other was all gone. There was considerable of the tissue of the chin gone, and a great deal of cicatricial tissue was present, so that there was a decided appearance of receding chin. The stumps of the inferior maxilla had gone together, as this model (Fig. 1) shows, and there was union—not only fibrous, but osseous. When she closed her mouth, she bit upon the mucous membrane of the palate; there was hardly room for the tongue, and she could scarcely articulate.

She was anesthetized, and the bones were separated. Previous to that, an impression had been taken, articulated as we would for an interdental splint, and an appliance made somewhat similar to an interdental splint, except that in the front it had a large piece of rubber to keep the lip out while the tissues were healing. This was inserted after the operation, and after the lapse of two or three weeks the tissues were thoroughly healed. The bones were now separated so that the articulation was normal.

During the time she had this temporary appliance in the mouth she vomited one day, and the nurse took out the appliance, but did not notify me until two days afterward, and I could not get it back. A new splint was made, making a new articulation, allowing the two frag-

FIG. 1.



ments to come closer together. (Fig. 2.) The permanent appliance was made of heavy German-silver wire. The teeth tilted somewhat toward the median line, so that it sprang in with quite some difficulty. When she went home she was advised not to take it out on the steamer, and after she arrived she had to go to a dentist to have it taken out, for three days; after that she could take it out herself. It was quite painful at first, and stretched the tissues somewhat, but the tissues had a chance to harden during the time she kept it in on the voyage home.

Dr. PERRY. Is her speech corrected?

Dr. GOULD. Before putting in the appliance her speech was so indistinct that I thought her an imbecile. After putting in the appliance she could speak very intelligibly, the drooling stopped, she could eat, and was quite comfortable. She naturally had a receding chin, and we could not restore this part.

Dr. PERRY. How were these portions of the maxilla spread?

Dr. GOULD. She was anesthetized. There had been osseous union; that was severed, and then the appliance similar

which have been verified by the observations of others.

The experiments referred to tend to show that it is not always possible to remove all of the pulp tissue from all root-canals, and that it is impossible to hermetically seal the root-canal of any tooth with any of the materials at present in use; also that many alveolar infections can be traced to a direct penetration of the crown and root-filling by pyogenic organisms.

Our knowledge of how completely

FIG. 2.



to an interdental splint was inserted. I would like to say that on the original model there was a left second bicuspid; it is missing on this model, having been extracted.

Dr. A. E. WEBSTER, Toronto, Canada, then read the following paper:

TREATMENT OF ROOT-CANALS.

An important subject should come up for discussion as often as new light is thrown upon it by the discovery of a fact. Noting that the whole time of a recent meeting of this society was devoted to a discussion of the management of devitalized and pulpless teeth I am assured of your interest in the subject. Moreover, the report of what was said at that meeting induces me to discuss this subject in the light of facts which I have discovered through experimentation, and

pulps may be removed from teeth can be judged only from reported experiments on the efficiency of root-filling materials. Most experiments have been made in the direction of filling canals—which, by the way, is the least essential. It is difficult to find recently extracted teeth with live pulps to experiment upon. Having had the opportunity for many years of obtaining not a few such teeth I have attempted to extract the pulps, afterward splitting the tooth open to note the success of the attempt. Judging from my efforts and those of others the pulps can be extracted from all the single straight round canals, but as they become curved and flat the difficulty increases. Very fine or flat canals cannot be thoroughly cleansed of pulp tissue by mechanical means alone; chemical agents must be employed; but a canal which is so fine that an instrument will not enter

it is not readily treated chemically. The agent must have a selective action, attacking the pulp tissue more vigorously than the dentin, and a tendency to follow the canal, enlarging it slightly. When this is accomplished it must cease to act upon the tissues beyond the end of the root, and the contents of the canal must be removed, which is not an easy operation. In view of these difficulties let us not deceive ourselves that all the tissue can readily be removed from root-canals in all teeth. Then there are those teeth which have had dead and putrescent pulps in them for some time, which must be cleansed. These admit of chemical treatment to more advantage.

The removal of the pulp of a tooth or the cleansing of a canal is attended with some risk, and the finer the canal the greater the risk and the less necessity for incurring that risk. There is the danger of breaking instruments in the canal; the danger of puncture and the danger of pericemental irritation and infection from instruments and chemicals. If a canal be very fine there is less danger from the amount of pulp tissue left than from the possible irritation in an attempt to remove it. And yet there is always the possibility of an acute infection if any be left. It is my conviction that there is often more probability of trouble following a case when the tissues at the apex have been disturbed by instruments or chemicals, than if a small portion of pulp has been left undisturbed. From experiments and observation of fully twenty thousand attempts by students, I believe it impossible to remove all the pulp tissue from all root-canals, and I believe it safer practice to leave some pulp than to risk a puncture or other irritation of the periapical tissues, because tissues once impaired by traumatism are never again so resistant to infection as they were originally.

I do not desire to teach that dead tissue should be sealed up in our bodies; I hope later to show that it is impossible to keep it from becoming infected. But I do desire to call attention to that which cannot be done with our present knowledge and skill. Any second-year student can

extract the pulps of upper incisors and canines, but these teeth rarely require the removal of their pulps, it being in the molar region that pulp-extractions are mostly indicated.

The apical end of the root-canal of a tooth cannot be hermetically sealed, nor can any part of it. Neither moisture nor bacteria can be stopped from passing through the crown of a tooth right to the apex within a few days. There is no root-filling material in use which will prevent the passage of moisture and bacteria.

Some four or five years ago I made experiments which proved to my satisfaction that root-canal fillings would not prevent the passage of moisture. Without repeating how these experiments were made, I refer you to the *Dominion Dental Journal* for April 1900. In May 1902 I reported some experiments to the New York State Dental Society which showed that the ordinary sealings for dressings do not exclude bacteria; again at the Odontographic Society clinic held in Chicago, February 1903, I reported experiments which showed that every root-filling material, including cements (excepting oxychlorid), gutta-perchas, collodions, paraffin, etc., when inserted in fine canals would leak and allow the passage of bacteria. In discussing my paper, Dr. Cook of Chicago reported corroborative experiments. Later, before the Iowa State Dental Society, he reported much more extensive experiments (report published in the February issue of the *American Dental Journal*), which show that not only do the fillings leak bacteria when packed into fine canals, but also that they penetrate through its substance as well as around the walls.

Although these facts have been before the profession for some time, there seems to be a disposition to disregard them. It may be that they have not been presented often enough and with sufficient force to come under the observation of those who speak and write on dental subjects; or perhaps there are those who do not believe the facts as stated, or possibly think that the technique was bad. To those who have not seen the published

articles on the subject may I be permitted to refer you to the files of the *DENTAL COSMOS*, the *Dental Review*, the *Dominion Dental Journal*, and the *American Dental Journal*, and to those who are inclined to doubt the significance of these experiments it might be said that they should point out wherein the experiments are deficient and the conclusions erroneous.

Having cleared the field on the hermetically sealing propositions, the question arises, Why fill root-canals at all? That is a real question: If the filling material will keep out neither moisture nor bacteria, why put it in? The main dependence must be put upon something else, not upon the filling material. In the vast majority of all devitalized molars and bicuspsids the whole of the pulp is not removed, and in no case are the root-canals filled so that bacteria will not pass through them; and yet it is stated by those who say they are in a position to judge that not more than three per cent. of devitalized teeth develop acute infections in the apical region. Why do the ninety-seven per cent. not become acutely inflamed? It must be for the same reasons that all those who have Klebs-Loeffler bacilli in their throats do not necessarily have diphtheria. The bacteria may not be virulent or the surroundings not suitable. It was noted by Cook and also by myself that a bacterium which had penetrated a gutta-percha filling underwent changes in its morphological characteristics, and would most likely require suitable surroundings before regaining its former virulence. Hence, if a large amount of dead pulp were left in a canal, such surroundings might be found and such a luxuriant growth ensue that the protective proteid bodies of the live tissues at the apex might be overcome and an abscess develop. Thus the necessity for removing all the pulp, and more especially the necessity for not wounding the apical tissues that they may become less resistant. Scar tissue, having a less perfect circulation, is less resistant.

Since it is impossible to mechanically exclude bacteria from a root-canal, and

impossible to always remove all the pulp, and since dependence must be mainly on the protective proteid bodies of the tissues, it would seem to be rational not to do anything that would in any way weaken this resistance. Teeth whose pulps have been devitalized by large doses of arsenic or an excessive amount of cocaine, or removed in a way to do violence to the tissues at the apex either by instruments or infection, are more likely to become subjects of discomfort than those not so treated. It would also seem rational to fill the canals of teeth with an antiseptic, non-toxic material—some material whose antiseptic properties are stable when in the absence of moisture but develop antiseptic power when moisture is present. While there is no moisture in a canal no antiseptic is required, because bacteria cannot develop. I do not know of a drug which is permanently antiseptic in the moist state, while a solid substance, though in itself not antiseptic, may have the power to become antiseptic in the presence of moisture. It would seem that in any case moisture should as far as possible be kept out of a root-canal, and the material that will most effectively do this is the best.

The iodine compounds which have had such favor in general surgery have the properties required for a permanent root-filling. It is a well-known fact that clinically iodoform is of great value as an antiseptic, while in the absence of living tissues it has little or no antiseptic powers at all. There is a drug lately put upon the market called "acetozone," and extensively used in the treatment of enteric infections, which would seem to have, according to the label on the bottle, all the properties required for a permanent root-filling. When in a dry state it can be mixed with other substances, such as paraffin, wax, or vaselin, without losing any of its potency, and yet as soon as brought into the presence of moisture it becomes a powerful disinfectant, and wholly non-toxic. It has not the objectionable features of odor or possible discoloration of the tooth possessed by the iodine compounds. It would seem wise to as far as possible fill the canal, and leave

as little space as possible for moisture, thus avoiding the more rapid dissipation of the disinfectant. While in my experiments I found oxychlorid to prevent moisture only a few days and bacteria for sixty days, yet Cook found that bacteria penetrated oxychlorid almost as rapidly as some of the other cements, and besides, it has the objectionable property of inducing irritation.

The third aspect of this question: The majority of alveolar infections are traceable to direct penetrations of the root-filling by bacteria from the oral cavity. While it must be admitted that infections do occur about the apex of the root with the pulp still alive, and also when the pulp is dead and with no possible communication from the crown, yet they are not nearly so frequent as where the canal and crown cavity have been filled. Bacteria must in some way reach the apex of the tooth, and most likely by the general circulation, where there is no break in the crown of the tooth. The greater frequency of infection in the other cases must be accounted for either by infection during the operation or by the penetration of the filling. Both Cook and myself have demonstrated that the latter is the most probable. I found that crown fillings of cement, amalgam, and gutta-percha, and root-fillings, are penetrated in a few days.

Discussion.

Dr. PERRY. There is a great deal in this paper that is worthy of very serious thought and close attention. In the routine of our work we no doubt overlook many things which are scientific facts, if they could but be investigated. Dr. Lord sometimes said he left canals open, claiming that they had no need to be filled, and if trouble should arise it was easier to reach. I think he once admitted, when the question was asked him, that that was the real reason he did it. He did not fill many roots, and he certainly did not fill all roots.

Dr. HATCH. Some time ago—I think about five years—in pursuance of my duties as chairman of the Committee on Practice of the New York State Society,

I corresponded with men all over the country on questions of interest to the profession. At that time pulp-mummification was being spoken of rather largely, and that was one of the questions I asked, hoping to bring out whether or not the method was being used successfully by the profession. The majority of the men who answered those questions at that time were of the opinion that pulp-mummification was a delusion and a snare. At that time, I was rather taken with it myself, and was using it in a few selected cases—in third molars and also in the cases of poor patients who did not feel they could spare the time and would otherwise have had the teeth extracted. I used Miller's preparation and Söderberg's preparation quite largely. Those cases progressed two or three years, some of them—and I think I have now seen about the last of them; at least I hope I have. They have all come home to roost, and as I remember it there was only one out of all those cases that stayed aseptic.*

I know nothing of this new preparation of which Dr. Webster speaks, but I have observed that of the many cotton fillings that I have taken out, done by other men (and when I say a cotton filling, I always suppose that the cotton was at the time of its insertion impregnated with some antiseptic), about the only ones that did not come out smelling badly were those that bore traces of iodoform.

If I were to use the mummification process again, I should not use the preparation recommended by either Miller or Söderberg. It is mixed in both cases with glycerin, and glycerin attracts moisture, and it seems to me we ought to use something to keep out all the moisture that we possibly can. I think it is a dangerous teaching to impart to the student body. Let us confine our "mummification business"—if that term is acceptable to Dr. Webster—to portions of

*[Upon looking up my records I find that my disgust at the failures presented had warped my judgment, and that by no means were they all failures. Just what the proportion is I cannot say until all the records have been gone over.—H. D. H.]

the pulp which we cannot by any possibility remove. There is nothing like trying. I know of a positive certainty that I cannot remove all the pulps from the roots of all teeth; but I do know that by keeping at it, and by sacrificing large portions of the crown in some cases, I can remove the pulp from the roots of some teeth that are ordinarily left unremoved, and I feel that the patient's condition is bettered by my so doing.

Dr. OTTOLENGUI. The essayist tells us what not to do with pulps or canals, and then he stopped his paper. He has not told us how to proceed.

Dr. WEBSTER. Take all the pulp out and then fill the root-canal with a non-toxic and thoroughly disinfecting root-canal filling.

Dr. OTTOLENGUI. That is like the man who got his newspaper upside down, and then wrote back that not being able to stand on his head he could not read it. Having told us there is no disinfectant that disinfects, and that we are not able to get all the contents out, the doctor now tells us we should get all the pulp out, and then use a disinfectant.

We are told in this paper, and in a previous paper, that none of the root-fillings that we are using exclude moisture; that they all leak bacteria. How do the bacteria enter the field. Suppose your root-canal filling does leak bacteria, and your crown filling does not? He mentioned oxyphosphate, and amalgam, and several other fillings, but he did not mention gold or porcelain. I think it would be a clever little wriggler that would go through a porcelain filling. We know that while cement fillings do wash out if they are the only fillings in the tooth, apparently they do not wash out when they have such a narrow margin exposed as is exposed in the cementing medium of porcelain fillings.

I want to know why you need anticipate any trouble at the end of a root if you injure the tissues about the apical space. I want to know whether the essayist means that the injury will come normally, or only by infection, and how the infection gets there—whether he means that the infection is carried there

by instrumentation, or whether it arrives through the blood tracts. Unless infection can reach the apical end of a root through the blood tracts, I cannot see, so far as bacteria are concerned, what difference it makes whether there is a root-filling in the canal that leaks bacteria or not, provided you have the crown of the tooth protected from the oral secretions. There is a hall with only two doors—one is orally and the other apically, and the bacteria must get in one way or the other. Now, if it can be shown that the bacteria neither traverses nor gets around the filling, it seems to me that the oral end is protected.

The doctor made the point that whilst it is true that sometimes we have alveolar infections on living teeth or on roots which are protected from the oral secretions, the bulk of them are on teeth that are open to oral infection. I differ from him. I say, whilst it is true that some alveolar abscesses occur on teeth which are simply neglected, and therefore left widely open to oral infection—as for example where a tooth decays until it reaches the pulp and the pain is endured until the pulp dies, and the pulp is left there until an abscess occurs—I believe quite as many abscesses occur on teeth filled by dentists. Quite as many of the abscesses we see are on teeth that have fillings in them, as on teeth which have no fillings. How do they become infected? I must even admit that I have occasionally seen abscesses on teeth filled with gold.

All this is to get the essayist to speak on the subject of whether apical infection can be made through the blood tracts, and how; and if he can tell us exactly what conditions would tend to produce such infection, I would like to know that also.

Dr. VAN WOERT. I have been very much at a loss to understand the suggestion of a root-filling that the essayist has made—this acetozone. If I remember correctly, it distinctly states on the label of the bottle that it disintegrates under any temperature above normal. One of the instructions upon the bottle is that it must be kept in a perfectly cool and

dry place to maintain its germicidal and antiseptic properties. If that be the case, how is it going to be a panacea in root-fillings when incorporated with any other preparation?

I agree with him in the fact that it is impossible to remove the pulp tissue from all canals, but I am strongly inclined to believe that it is impossible for bacteria to penetrate from the crown of the tooth to the canal, and that if there is any infection it must come from the apical foramen or from decomposed matter left in the root. My experience in filling root-canals is that when imperfectly and improperly done I have trouble. When I have succeeded in removing, if not all, the larger portion of a pulp and filling the canal with any of the preparations known today as antiseptic and germicidal preparations for root-canal fillings, the majority of cases are successful.

Sometimes cases present where we feel we have accomplished marvelous results in manipulative ability, removing all of the pulp tissue and inserting a filling which we consider nearly perfect, yet trouble follows; but I do not believe it comes from the filling itself, whether it is gold, amalgam, or anything else. I am strongly inclined to the belief that it is largely due to the fact that we do not fill root-canals, that we do not remove everything, and from evidences I have had in making some skiagraphs that show the actual facts of work from the hands of gentlemen who have pretended that they always fill without exception every root-canal to the foramen, I am more than ever inclined to believe that a large percentage of our failures in root-canal filling is due to imperfect manipulation rather than to the material we use.

I do not pretend to fill all root-canals thoroughly. I hope no one present will accuse me of that, for I never said it. In the large majority of cases—and I might say all cases—where failure has come, it is due more to imperfect manipulation than anything else. The material itself, I think, plays a very small part in the result.

Dr. OTTOLENGUI. I would like to ask that we depart from the regular order,

and instead of waiting for Dr. Webster to finish the discussion have him answer the questions now. I will move that Dr. Webster be requested to reply to queries as we proceed.

The motion was carried.

Dr. WEBSTER. In reply to Dr. Hatch, I wish to say I do not desire anyone to have the idea that I believe in mummifying pulps. I thought I made that clear.

As for the preparation of acetozone, I also want to say that I do not state things very positively about that either, because I do not know. I have made some experiments during the past six months with acetozone, and have tried the temperature test in the laboratory, and then made tests as to its disinfecting properties at the temperature of probably 105°. I used melted paraffin. It did not seem to have lost much of its potency at that temperature, so I should judge the temperature of the body would not very much interfere with the disinfecting properties of acetozone.

As to Dr. Ottolengui's question: He says that I stated what not to do, rather than what to do. In the first place, we cannot put our dependence upon a mechanical root-canal filling. Nor can we always put our dependence upon the possibility of removing all the pulp, and we know that about ninety-seven per cent. of all cases are successful in the way they are ordinarily treated by practitioners; then there must be some other factor in the success of those ninety-seven per cent. That factor must be the protective proteid bodies of the system in the general circulation. Large doses of arsenic or cocaine, or traumatism, will weaken the resistance of the tissues, and thus defeat our object in root-filling. Tissues that have become intoxicated by poisonous doses, tissues which have been destroyed and filled in with cicatricial tissue, are less resistant. The circulation is less perfect, and the tissue is more easily destroyed and does not contain the protection against infection that sound normal tissue has. We know positively that infection and pus organisms must be carried by the general circulation. How else could we account for an osteomyelitis?

How else for a tuberculous hip? We must admit that at the end of a root there is the possibility of infection, and if those tissues have been weakened by sending drills through the end of the root into the soft tissues, or poisoned with cocain or with arsenic, they are less resistant and more likely to be the focus of an infection than if not so treated.

As to the penetration of gold, I have not made the experiments, and consequently did not put it in the paper. As soon as I do I will put it in. I think it will be in the affirmative too—not in all cases, but as the majority put them in.

I am a little puzzled to know how to put in an experimental gold filling unless I have steel tubes made for the purpose. It is quite difficult to pack a gold filling in a glass tube that will weigh up to 17 specific gravity. Sp. gr. 15 is said to be as low a gravity as makes a gold filling. Take for example the best gold filling you have made in a tube; wash it with alcohol, hold it over the lamp, and notice what goes up in the air. I do not know where that organic matter comes from that makes the smoke, but something has happened there.

Dr. OTTOLENGUI. As I understand it, this acetozone would be something that as soon as it came in contact with moisture would become bactericidal. You suggested mixing it with paraffin.

Dr. WEBSTER. It may be mixed with certain solid substances which are not organic, and it will not lose its potency.

Dr. OTTOLENGUI. You also spoke of vaselin, and I have always wondered how, when these things are mixed with any substances that are not soluble in water, how you can get the acetozone out of the paraffin or gutta-percha or chloro-percha.

Dr. WEBSTER. If there be any acetozone on the surface, or at the apex, and then filled over to keep as much moisture out as possible, that would seem to be rational. Dr. Ottolengui's criticism is perfectly proper, that unless this disinfectant is get-at-able by moisture it will not be of any value.

Dr. VAN WOERT. Acetozone, as I understand it, is soluble; after it has been dissolved in water for instance, and

retained in that solution for about forty-eight hours, it is claimed that it disintegrates. What will become of that, if admitting that the acetozone has got in its work and killed the bacteria around it—what will you do with the disintegrated acetozone that is in the water?

Dr. WEBSTER. There is that objection. When I thought over this question, I took a few teeth and tried them in the laboratory in as many ways as I could. The laboratory tests prove nothing. What you say I believe to be true. If all the organisms had been destroyed, and there is a cavity left, then the only possibility will be in the tissues carrying away that water and filling the cavity with granular tissue. If that does not occur, and the water remains, it may possibly become infected.

Dr. VAN WOERT. Is it not a well-known fact that in typhoid the water that is infected with the germ, even if boiled is not rid of the carcass. You may kill it for the time, but it remains a menace to the individual just as much as the original germ. Here we have this carcass, this germ killed at the end of the root with the acetozone, and on top of it the disintegrated and degenerated acetozone to overcome in the end.

Dr. WEBSTER. Yes; the same objection as capping a pulp with carbolic acid. Although we destroy the organism, we have waste bodies, and the dead organisms remain, and they are greater toxics than the living organisms.

Dr. OTTOLENGUI. I take issue with that statement. I do not think that is the proposition at all. I do not think we need something in that root-filling to destroy bacteria, but to inhibit. We are supposed to destroy all the bacteria present before we fill the root. What we need is something in that root-canal which will make it impossible for a medium to form which will attract the passing multitude of bacteria in that blood tract. It is like keeping a cat to drive mice out of your house. It does not kill the mice, but they will not stay where the cat is. The mice know enough not to stop there. They do not take chances to find out whether the cat is a

mouser or not; they move. As long as the bacteria are traveling they do no harm; consequently we do not have any "carcasses" there. The essayist has pointed out from his laboratory test that all our root-fillings leak bacteria, and that they fail; then he admits that ninety-seven per cent. of the root-fillings succeed, and he explains that by the action of the proteids which inhibit infection. I explain it by saying that the root-filling is sufficient. It makes no difference whether the proteid is there or not. Anything that succeeds in ninety-seven per cent. of cases is good enough. If a root-filling succeeds in ninety-seven per cent. of cases, it is better than any crown-filling I know of.

Dr. WEBSTER. I am thankful to the gentlemen who have discussed the subject. One man in New York reported some six hundred cases in which about ninety-seven per cent. were successful, and some men in Wisconsin made records and reported the same. We must admit in the first place that we do not take all the pulp out of all teeth, and that we do not mechanically prohibit bacteria and moisture from entering, and yet they do not develop infection. It must be on account of the protective proteids of the living body. As Dr. Ottolengui said, the root-filling is sufficient then.

Dr. VAN WOERT moved a vote of thanks to Dr. Webster for his interesting paper.

The motion was unanimously carried.

Dr. WEBSTER. I thank you. I had a purpose in writing this paper for this society, because I saw it reported from this society that root-canals were hermetically sealed at the apex, and it made little difference whether the canals were sealed at any other portion or not. I expected somebody to hermetically seal that point this evening.

The President then introduced Mr. EUSTACE H. GANE, who addressed the audience on the subject of

THE DENTAL APPLICATION OF SOME NEW OXYGEN COMPOUNDS.

My object in coming before you is to demonstrate the properties of some new

chemical compounds of oxygen, and to explain as far as I am able their application to dental therapeutics. I have been very much interested in the discussion upon the last paper, because it introduces in a very happy manner the subject of my remarks, and it may be that some of the compounds to which I shall call your attention might find application in just such cases.

The particular branch of dentistry to which these oxygen compounds are applicable is principally in the direction of oral hygiene, a subject which I think you will agree with me is receiving more and more attention, not only from the medical profession, but from the general public. I say the medical profession and the public, because I realize that the dentists have for a number of years considered this a matter of vital importance, and the educational work which you have been carrying on is beginning to bear fruit in the realization of the fact that a clean mouth is one of the first requisites for the preservation of a healthy body.

It is only within the last few years that physicians generally have been paying attention to the work you have been carrying on, by drawing their patients' attention to the fact that many disorders of the stomach, and even some general systemic diseases, particularly disorders connected with pus, may arise from septic mouths. This, as has been pointed out by a leading English authority, may happen not only in cases of pyorrhea but also from diseases of the gums, stomatitis, etc., due to septic plates and to the bridge and crown work now so much in vogue, also to the pus organisms associated with dental caries, it being an admitted fact that no pus organisms are so virulent as those found in necrosed bone. Considerable research has been devoted to the problem of finding something which would be generally applicable to destroying the various organisms which find lodgment in the human mouth.

The dentist was one of the first to find out that in view of our present artificial way of living, artificial methods were necessary for the proper care and cleans-

ing of the mouth and teeth. For centuries man has devoted a certain amount of attention to this subject, and of late years innumerable antiseptic substances have been placed at the disposal of the surgeon, but very little advance has been made in the direction of chemical preparations which would be serviceable in producing asepsis of the mouth. Dentifrices, mouth-washes, and tooth-powders have simply exerted a mechanical cleansing effect, and have been lacking in antiseptic properties.

Of all the germicidal remedies at the dentist's service probably hydrogen dioxid is the most valuable. The reason is easy to see when the nature of the product is considered. Its antiseptic and germicidal properties are due to the ease with which it gives up oxygen in the nascent state. The element oxygen is peculiar in many ways. It is an interesting element, and probably the only one absolutely necessary to human life. We might do without one or more of the other elements, but it seems certain that without oxygen no life could exist. To this element are due the properties of the strong acids; to it bleaching agents owe their value as such, and to its presence in combination some of our most useful disinfectants owe their germicidal action. Hydrogen dioxid, while very useful, is nevertheless not applicable to all the purposes of the dentist, and chemists for some time have been looking for new compounds of oxygen which would be more generally available. I may say that it is just in some such direction that the chemist might be useful to the dentist. The study of chemistry is progressing more rapidly probably than many other branches of science, and we are looking to the time when it will only be necessary for the dentist or physician to indicate what results he wishes to obtain when the chemist will place the necessary compound at his service. Before this era can be brought about, it is necessary for the dentist to indicate the exact work which he wants certain compounds to produce. If he can do that there should not be any great difficulty on the part of the chemist in supplying that want.

The value of hydrogen dioxid, as I have said, depends on the fact that it readily liberates oxygen. This instability unfortunately limits its availability, and efforts to obtain it in a more available form have been made with but little success up to the present. It is possible to produce almost pure hydrogen dioxid, and one German chemist has succeeded in crystallizing this substance, and claims that it can be transported with very little danger. In its pure state it does not seem, however, much more available for the purposes required than the dilute preparations we are in the habit of using.

The introduction of sodium peroxid, which is familiar to you, and which is used to a considerable extent by dentists, was an advance in the direction indicated. Sodium peroxid is valuable to the dentist on account of the saponifying action it possesses in addition to its oxidizing properties. The objections to it are the enormous heat generated in contact with moisture, its caustic properties, and the danger of fire when in contact with moisture and organic substances.

The limitations of hydrogen dioxid induced investigators to turn their attention to the organic field, and certain so-called organic peroxids have been introduced. These organic peroxids are peroxids in name only. They have none of the properties of an inorganic peroxid, and are to this extent incorrectly named. They are rather to be classed as anhydrides of acids, for when brought in contact with water they become converted into acid substances. There is one chemical reaction characteristic of all oxygen compounds which contain available oxygen; they will decolorize a solution of potassium permanganate. These organic peroxids do not possess this property. I show you one of them which is fairly soluble in water, as you see, and if I immerse a piece of blue litmus paper in the solution you will see that the blue color will rapidly change to red. It changes distinctly, showing that the compound has been transformed into an acid.

If I acidulate this solution with a little sulfuric acid, and then add a few drops

of potassium permanganate, the solution should at once change color if it contains any available oxygen. You see that the pink color persists, showing that the compound does not contain available oxygen.

Dr. WEBSTER. On what does its disinfecting power depend?

Mr. GANE. Most of these aromatic organic compounds are what I may call natural antiseptics, like creasote and carbolic acid.

The so-called organic peroxids not being available for the liberation of oxygen, attempts have been made to form direct compounds of hydrogen dioxid with certain salts. Work in this field has led to some very interesting discoveries. We find that if we take a concentrated solution of hydrogen dioxid, say about thirty per cent., and dissolve in this solution certain neutral salts that contain water of crystallization, we can crystallize from that solution compounds which will contain in place of water of crystallization, hydrogen dioxid of crystallization. Among these salts are sodium sulfate, borax, and alum. All of these will crystallize with hydrogen dioxid in place of water of crystallization.

I show you some sodium sulfate crystallized with hydrogen dioxid. It contains about ten per cent. pure hydrogen dioxid, and is about three times as strong as the solutions of hydrogen dioxid usually supplied to physicians and dentists. I will show you that it readily liberates oxygen when mixed with permanganate solution. These compounds are not available at present for medical use, owing to the difficulty in preparing them. The solutions must stand in a vacuum over sulfuric acid, which will absorb the water gradually, and it takes sometimes a good many weeks to obtain the crystals in any quantity. I will acidulate a solution and show you the reaction with potassium permanganate.

Dr. OTTOLENGUI. Why do you acidulate them?

Mr. GANE. It is necessary where you have an alkaline solution, in order to prevent the precipitation of manganese hydrate, otherwise you would get a brown

precipitate which would mask the reaction. I simply do it to show you the evolution of oxygen more clearly.

These hydrogen dioxid compounds not being available on a commercial scale, attention was turned to some of the alkali salts. Here we find that we can combine directly hydrogen dioxid with certain alkali salts. The two that have so far been prepared are compounds of sodium carbonate and borax with pure hydrogen dioxid.

These are not simply salts containing hydrogen dioxid of crystallization in place of water, but are direct compounds of hydrogen dioxid with the salt, resulting in the formation of either sodium carbonate or sodium borate plus hydrogen dioxid, or of a percarbonate or a perborate. These compounds can be prepared in sufficient quantities, and are now available for medical and dental use. The sodium carbonate compound can be prepared to contain about twenty-five per cent. of hydrogen dioxid, and is a preparation which will to a large extent take the place of sodium peroxid in dentistry. It is readily soluble in water, forming a solution of sodium carbonate and hydrogen dioxid, and will do probably all that sodium dioxid will do, having the same saponifying effect on fats, oils, and other debris, and rendering it useful in cleansing out root-canals, for example. My knowledge of dental surgery is too limited for me to be able to point out all its usefulness to the dentist. You can judge of that better than I can. The borax compound can be prepared to contain a maximum of about twenty per cent. of hydrogen dioxid. It is not so soluble in water, and the oxygen is more slowly liberated. It might be useful where a slow oxidizing action is required, as for example for sealing up in a tooth for bleaching purposes.

I show you specimens of both salts. The sodium carbonate compound crystallizes in very pretty needle-shaped crystals containing about twenty-five per cent. of hydrogen dioxid, and it has the same reaction toward permanganate that all the inorganic peroxids have. It is very soluble in water, with a slight evolution

of oxygen. When I acidulate this solution of the sodium carbonate compound you notice an effervescence due to the liberation of carbonic acid, and upon adding some potassium permanganate solution the permanganate is decolorized, with a copious liberation of oxygen gas. You will notice that the compound with borax is a good deal less soluble in water. It will rapidly dissolve, however, if a little acid be added to it. It decolorizes, as you will see, the permanganate solution, with the same effervescence and liberation of oxygen.

Useful as these compounds are, they are not applicable for the preparation of dentifrices, owing to the fact that exposure to air causes slow decomposition, and the preparation of an oxygen compound which would be available as a dentifrice and for purposes of mouth-sterilization has long been an objective both of dentists and of manufacturing houses. Considerable attention has been devoted of late years to the peroxids of the alkaline earths. The barium peroxid has long been used for the preparation of hydrogen dioxid. Magnesium and zinc peroxids have recently been introduced into medicine, while the lithium dioxid has also been prepared, and has been used in France for the production of oxygen gas. None of these, however, seemed likely to be of use in the direction mentioned.

There is one compound, however, the calcium peroxid, which seemed theoretically to be the most suitable for dental purposes. It is not new. It was discovered in the early part of the nineteenth century by the same French chemist who discovered hydrogen dioxid, but it has been impossible to prepare it on any large scale. It was originally prepared by taking a solution of calcium hydrate, adding to that a three per cent. solution of hydrogen dioxid, and allowing it to stand until the calcium dioxid was precipitated. Enormous quantities of liquids had to be used to obtain a small amount of precipitate. Recently, however, owing to the development of the electrical industry at Niagara and the utilization of immense electrical power, it has been

possible to prepare this compound on a commercial scale, and we are now able to produce a preparation that I think the dental profession has long been looking for. Calcium peroxid is slowly decomposed by water, with liberation of oxygen, and it is this property which renders it especially available for dental purposes. It is generally accepted by dentists today that dental caries is due to acid-producing organisms, which lodge on the surface of the teeth and excrete lactic acid. Therefore, when calcium peroxid comes in contact with the fluids of the mouth nascent oxygen would be liberated, or when it comes in contact with these local acid areas, whether due to the organisms of decay, or to acid fermentations, or to an acid condition of the mouth such as causes dental erosions, then these acids would decompose the calcium peroxid, liberating hydrogen dioxid just at the point where it is most needed. Its action would be, so to speak, automatic, liberating hydrogen dioxid only when and where it was needed.

The calcium peroxid is more available than the sodium compounds of which I have been speaking, because it is slower in its action, and it is more available than hydrogen dioxid because the oxygen is not all liberated at once, and because it is more palatable to the taste. I will demonstrate its properties to you.

I would like to show you also how this compound is decomposed by the acid of decay, lactic acid. When the lactic acid comes in contact with this lime, you will notice there is a copious liberation of gas, and the lime passes into solution as calcium lactate. If I add a little permanganate to the solution it becomes decolorized in exactly the same way as with other peroxids. An additional feature of this lime compound is the fact that when mixed with water it is converted into milk of lime, which acts as an efficient antacid. It might be added to a dentifrice, and the dentifrice would serve the triple purpose of a mouth-wash, an antacid, and a cleanser, giving the dentifrice properties which would not be merely mechanical, but chemical as well. Such a dentifrice would not only clean

the teeth, but would sterilize the mouth—a problem which the oral therapist had long sought to solve. It is thus possible to give the patient a simple means not only of preserving the teeth from decay, but of preventing, to a large degree, the ingress of those pathogenic bacteria which frequently found a suitable field of development in the human mouth. An added advantage was the avoidance of the necessity of using a mouth-wash as well as a tooth-powder, something which it was very difficult to induce the average person to do.

Prof. WARD. There are a number of things which might be said about these compounds, which are certainly very interesting from a dental as well as from a chemical standpoint. Being a chemist, of course this subject is exceedingly interesting to me, and being in a dental school it has an added interest. This matter of oxygen being evolved from certain compounds is becoming a very important one. Nascent oxygen, as we call it—that is, at its maximum of activity—will cause certain chemical reactions or changes which are not produced by ordinary oxygen—or as it is in the atmosphere. It has been proved that this form of oxygen is destructive to all forms of bacteria, so in cases where bacteria are in the mouth, producing changes in the teeth, it seems we could not have a better substance than one evolving nascent oxygen to destroy those bacteria. It will destroy even the germs, I believe. In the compound calcium peroxid we have an ideal substance that ought to be very successful in the composition of a tooth-powder, which I believe is the use that is intended to be made of it.

The other salts and compounds we have heard about are very interesting, and a great deal might be said about them. Some of them I have been interested in because they are quite recent, and very little is known about them. As for the organic compounds, I do not think they have any practical application. I remember a compound of acetic acid that was described in the works on organic chemistry. When first prepared it was very unstable. It was described

as a liquid, and was very explosive. Recently a man named Neff has succeeded in preparing a crystalline compound of that substance, but still finds it is a dangerous material to handle. That is a little different from those organic compounds you have. I have not looked up the matter of their applications, but I think there is a great field for these organic peroxids.

As Mr. Gane said, hydrogen dioxid is not new. I think it was discovered in the early part of the nineteenth century, about 1818, by a man named Thénard, and it is almost a century since anything has been done with it. About 1876, in an English journal, there appeared an article about the application of hydrogen dioxid for disinfecting purposes. I think that was the first time it was applied as a disinfectant. It is only recently since they prepared pure hydrogen dioxid, and thus have been able to apply it for the preparation of these compounds. It certainly has been a very useful substance in chemical as well as dental work. It is being used a great deal now in chemical operations, for analysis especially. It is very useful, because when it has done its work it leaves nothing but water. That, I think, makes it useful in dentistry.

Mr. KEENAN. I had not anticipated taking part in this discussion. But the subject of dentifrices is one of great interest to me. I am somewhat familiar with the efforts that have been made in the past by pharmacists to perfect dentifrice preparations in both the liquid and powder form, from my connection with the pharmaceutical press as the editor of a drug journal for the past twelve years or more.

It is vastly interesting for anyone connected with pharmacy to trace the vicissitudes of dental formulas. Pharmacists have dentists to thank for many a new and wonderful mixture, each succeeding one of which was to be the acme of perfection as regards antiseptic and detergent power. A simple compound of camphor and chalk, in the proportion of one part of the former to three parts of the latter, long held sway, but the use of

some detergent, such as soap, or alkali, later came to be considered indispensable, and some awful messes resulted in consequence. Charcoal was popular for a time on account of its supposed deodorant property, but is not much used nowadays, as much because it caused discoloration by getting between the gums and the teeth as from a growing skepticism regarding its antiseptic value. Pharmacists are greatly indebted to dentists for suggestions regarding the nature of desirable additions to tooth-powders, as well as regards what should be left out. It is not so long since they learned that the use of gritty and abrasive substances, like pumice stone and cuttlefish bone, is objectionable because of the abrading action which such substances exert on the delicate enamel of the teeth.

Of late years special efforts have been made in the production of dentifrice compounds to bring together such ingredients as would upon application to the teeth and gums produce a sense of coolness, combined of course with real antiseptic power. The acid dentifrice of the French Codex is a good example of this class of compounds, consisting, as it does, of a mixture of cream of tartar and sugar of milk, highly flavored with oil of peppermint. One ingenious investigator hit upon potassium chlorate as a valuable addition to tooth-powders, being evidently of the opinion that the salt would readily part with its oxygen when brought into contact with the moisture of the mouth. The antiseptic property of potassium chlorate applied in this way is more or less chimerical, and powders

of this kind were never popular, what the laity demanded in a tooth-powder being a combination of substances and flavors that leave a pungent and slightly sweetish taste in the mouth.

The application of the medicinal peroxides as dentifrice compounds is of particular interest to pharmacists, the subject having attracted a great deal of attention since Prof. Fränkel's address to the Fifth International Congress of Applied Chemistry in explanation of the chemical and therapeutical applications of the newly discovered peroxides of the alkali earths. Mr. Gane's application of this discovery to the manufacture of dentifrice compounds clearly marks a new era in the history of dentistry. He uses a calcium peroxid which in contact with the moisture of the mouth is resolved into milk of lime, hydrogen dioxid and water, the dioxid being in turn split up into its elementary constituents, thus liberating free oxygen at desired points, and securing at the same time an antacid action from the milk of lime.

Gentlemen, I thank you for the courteous attention you have accorded, and I feel like congratulating the society on being the medium through which the new advance in dental therapeutics is made public.

Dr. TRACY. I move we give a hearty vote of thanks to Mr. Gane for presenting this matter to us.

The motion was carried.

Adjournment.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-sixth Annual Meeting.

(Continued from page 756.)

Dr. H. Smith's paper was passed, the society next listening to a paper by Dr. GEORGE E. HUNT, Indianapolis, Ind., on the "Inhibition of Dental Caries." (Published in full at page 818 of the present issue of the Cosmos.)

Discussion.

Dr. H. D. HATCH, New York. I appreciate the fact that the hour is late, and I will take but a moment of your time. We have heard the advocates of two different systems, and I must say that after considering them both I think the best thing for us to do is to strike a happy medium between the two. Now, in regard to the treatment advocated by Dr. D. D. Smith, while he objects to its being called mechanical, I will call it so. For instance, my first step in the treatment of pyorrhea is to as thoroughly as possible remove all deposits, mechanically cleansing and polishing the teeth. But in the course of a few days—the next appointment for treatment—some patients will come back with the teeth covered with a whitish scum. Now, imagine what that condition would have been in the course of a month with no intervening treatment. I should therefore, as between Dr. D. D. Smith's method on the one hand and Dr. Hunt's on the other, endeavor to strike a happy medium by using an antiseptic mouth-wash in connection with the mechanical treatment.

Dr. Hunt in his paper—and we must give him credit for the great amount of original work he has done to produce the paper—spoke of experiments with many substances, but I am sorry that he did not experiment with some others, such as carbolic acid or hydrogen dioxid, which I consider among the most valuable ingredients for mouth-washes. As

it was, however, I am glad to see our old friend benzoic acid come out ahead of some of the newer and much-vaunted agents, such as formalin.

Returning to the question of mercury bichlorid as a mouth-wash, it is generally considered a dangerous drug, and if put up by a responsible druggist would be labeled "Poison," or "Caution—Do not take internally." Besides, this formula is acid in reaction, and it seems to me that a wash for general use ought to be alkaline as well as antiseptic. In cases of erosion, that most destructive disease, where the teeth are usually found clean and are kept clean, there seems to be no need for further mechanical cleansing, not so much for antiseptics as for alkalinity. Personally I prefer to combine alkalinity, antiseptics, and mechanical cleansing in a tooth-powder to be used on a brush in the usual way.

I took this solution, Dr. Hunt's formula, and dropped into it some pure gold foil and new gold fillings. These were unaffected by the solution. It would, however, tarnish 22-k. gold plate and old gold fillings. I then added some old amalgam that had never been in the mouth, thinking that there might be some galvanic action, and to my astonishment, in the course of a few days the solution had entirely dissolved the amalgam fillings, but had not affected the gold fillings. The same action was noted on amalgam fillings put in a separate bottle with this solution.

Dr. HUNT (closing the discussion). It seems the paper was obscure in spite of my effort to write plain English. I argue that, in connection with other measures, it will be a part of the best system of treatment devised for this purpose. Some character of wash is ap-

plicable in all cases, and the wash indicated should be used to supplement other measures.

Dr. Smith objects to his system being called mechanical. In view of that I suggest we call it manual cleansing, since it is certainly cleansing by hand. He would characterize my paper as theoretical. It may be so, although every effort was made to give it a practical bearing. It would be impossible for me to argue the question of the inhibition of caries with a man who does not admit the bacterial origin of the disease.

The number of micro-organisms in the spittle was indicated by each culture, and if we found that an agent reduced the number we felt justified in assuming that it had a proportionate value in inhibiting caries. In my own mouth mercuric chlorid slightly discolored the gold fillings, but the discoloration was readily removed by polishing. I do not use a powder, but I believe the use of a powder occasionally would keep the fillings from discoloring at all.

I do not wish to be understood as advocating the indiscriminate use of mercuric chlorid as a wash. The point I want to make is that in those mouths showing a decided predisposition to caries, the dentist is in duty bound to exhaust every resource to save the teeth, and in these mouths he has as much right to prescribe mercuric chlorid, even although it is a poison in certain doses, taken internally, as though he were a practicing physician confronted with a case where the proper administration of a so-called poison was indicated. The formula presented may not suit your taste. If it does not, vary the ingredients until your palate is satisfied. The mercuric chlorid is the only constituent of value, the others being introduced solely to make the wash more palatable.

On motion the subject was passed.

Dr. M. L. RHEIN, New York. Mr. President, I would like to offer a resolution to the society. I do it at this time in order that it may reach the Executive Council in time so that it may be returned to the society if necessary, and suitable action taken thereon. It is with

reference to the subject that we have just been considering. Your attention has very likely been frequently called to the antiquated views on dentistry which from time to time appear in the daily press. They impart to the public an entirely erroneous view of dentistry, especially on the prophylactic care of the teeth. Instead of being an aid in educating the masses, it would appear as though they were being used for exactly the opposite purpose.

No less than thirty clippings of an article published in the *New York Sun* of April 17th were sent to me by patients. This is an evidence of the attention paid to such matters. This purported to be an interview with the *most prominent* (anonymous) dentist in New York, and tended to show that the frequent cleansing and polishing of the teeth by the dentist and patient was the cause of the great loss of teeth at the present time. Can anything more damnable be inaugurated than such doctrine in a metropolitan newspaper? This called to my mind the good work that was done in Chicago some years ago by the publishing of a brochure for general distribution by the Chicago Odontological Society on "Pulpless Teeth."

It seemed to me that if the society would adopt a similar procedure in reference to the prophylactic care of the teeth, it would be a means of enlightening the masses and tend only to the benefit of the general public. It would officially contradict the misrepresentations of the public press on this subject. It would remove the so-called necessity of some of our good men acting in an unethical manner, allowing themselves to be interviewed, and thus turning aside from the path of professionalism to that of quackery. I therefore, Mr. President, offer the following resolution:

RESOLVED, That a committee of three be appointed who, under the authorization of the Dental Society of the State of New York, shall compile and write an article on "The Prophylactic Care of the Teeth." This shall be published in pamphlet form by the society for distribution in quantity at nominal cost of publication. It shall also be furnished to the

local press throughout the state for their use. The names of the committee shall not appear on the printed article, but simply the authority of the Dental Society of the State of New York.

The next order of business was the election of officers for the ensuing year, which resulted as follows:

President—Wm. Jarvie, Brooklyn.

Vice-President—W. A. White, Phelps.

Secretary—W. C. Deane, New York.

Treasurer—W. C. Stainton, Buffalo.

Correspondent — Ellison Hillyer, Brooklyn.

Adjourned until 8 o'clock.

FIRST DAY—*Evening Session.*

The evening session was called to order by the president at 8 o'clock.

The first paper of the evening was by Dr. MATTHEW H. CRYER, Philadelphia, on "Typical and Atypical Occlusion of the Teeth, in Relation to the Correction of Irregularities." (Published in full at page 713 of September Cosmos.)

Discussion.

Dr. V. H. JACKSON, New York. I will not discuss the paper in detail but will simply make a few remarks upon it. It is an important paper, and it includes many ideas the discussion of which to a limit would be more profitable, I think, than to try to cover the whole paper. We are all aware, or should be, of the excellent work that Dr. Cryer has been doing in connection with the study of the bones of the face and skull, the results of his investigations having been presented to the profession from time to time for several years. In a most creditable manner he has given us much that we should carry home and consider.

I have been interested in his remarks on occlusion, and especially as to the development of the bones of the jaws. I have spent some time in this kind of work, and agree with him in almost all of the conclusions presented. I am convinced that the principal anterior development of the lower jaw takes place at the union of the ramus with the body, and not so much from an interstitial

growth in the body itself, in connection with which the doctor brought out the point of the changed position of the mental foramen. Several years ago I read a paper regarding the development of the jaws, and at that time called attention especially to the anterior development of the upper jaw. I pointed out that the pterygoid processes of the sphenoid are fixed points, anterior to which all development takes place, at the edge and in front of the palate bone.*

I agree with the doctor that much harm results from the too close application of any particular rule in the regulation of the teeth; but, on the other hand, certain principles need to be kept before us, and I cannot agree with one author who "puts himself on record as being opposed to 'systems,' proceeding rather on the basis that, with a thorough knowledge of the causes, remedial measures will suggest themselves." A knowledge of the etiology or causes of irregularities is very important, but the patient is concerned in the ability of the operator to correct the irregularity.

Regarding the extraction of teeth, no good dentist or orthodontist will permit a natural tooth to be sacrificed without its being necessary. His work is correcting mal-conditions, and extraction of teeth is often required to bring about the best results. I will here present models of a case that was regulated by a prominent dentist after the plan recommended by a specialist who states that extraction is unnecessary. It is my intention to speak more fully on this subject at a later time. You will see by the models that in the attempt to correct the irregularity the occlusion was disarranged and the arch made so full as to bring about a serious deformity of the face. The dentist appealed to me as to how to get out of the difficulty. I recommended the extraction of some of the teeth.

Here is another model, showing a case in which I think very few of you would suggest an attempt to regulate without extraction. When extraction is required to make space for prominent teeth, it

* See Cosmos, vol. xxxii, 1890, page 290.

is usually better to remove the first bicuspid rather than a second or a first molar, as the removal of either of the latter would cause the anchorage to be insufficient for moving the front teeth inward; but even in extreme prominence, if the molars be decayed, they should be extracted when the structure of the bicuspid is good, and the latter moved backward. Of course it would take a considerable time, but for this purpose I use supplemental force exterior to the mouth—such as the cross-bar and cranial cap, applying it for either the upper or the lower arch—which hastens the operation.

In Fig. 12 [p. 722] the essayist shows the result of impaction of the third molars, advising their extraction. It has been my custom to save these teeth when practicable, even though they be in a malposition and of poor structure. This is for two reasons. First, the arch is not complete without them—through their development they assist in its normal expansion; and second, we find that the structure of the third molars improves after maturity; often they are the ones to do the chewing later in life, after all the other molars are lost. Some claim that the third molars are soft and not worth saving. Why are these teeth soft? It is because they are developed at the time the rest of the bony system is in the active stage of development, and when there is a lack of bone-building material. After the long bones have attained their normal growth, they receive the same nutrient supply, and the teeth as well as the other bones become more dense.

When the third molars are in a malposition I recommend their correction with an appliance consisting, first, of a strong base-wire, suitably anchored to the teeth. A small spring in the form of a U-shaped loop is arranged to extend back from the appliance to engage with the irregular molar, the loop pointing downward with the free end shaped like a hook, either to pass in front of the molar at the neck, or to hook into a pit made for it in the crown. Force is secured by opening the loop of the spring from time

to time. I have had several cases where the teeth have been moved backward in this manner.

Dr. WM. CARR, New York. The society is to be congratulated upon having a paper read before it on orthodontia from a scientific standpoint. There can be no question, in my opinion, that orthodontists too often endeavor, without knowledge of the anatomy of the associate parts, to force dentures into such positions as may suit their fancy. I believe that in many instances attempts are made to correct irregularities when, if left to herself, Nature would perform the work far better than can be done by mechanical interference.

Our essayist has alluded to one subject which I believe should receive more attention—not on the part of the orthodontist, but by the general practitioner, who, in many cases, owing to the wide range of his experience, is better able to determine the proper course to pursue than is the specialist, who necessarily has applied himself to one branch of study and practice. I must believe in the timely and judicious extraction of teeth, not only for irregularities, but also for other causes. I agree with the essayist that many mouths would have served the patients for sixty years or longer, if in their youth four of the permanent molars or some of the bicuspid had been removed. If I can regulate a set of teeth by the judicious extraction of some individual teeth, I think I am doing my patients a greater service than if I had subjected them to a tedious operation, running the risk of obtaining such results as I have often seen where an operator has attempted to regulate a denture without extraction. Of course in most cases the practitioner succeeds in regulating the teeth, but in many instances you will find, a few months or years thereafter, a slight discoloration, as was the case with a patient who called upon me recently. The upper incisors and laterals had been regulated some two or more years before. The patient, of course, was greatly pleased with the results obtained at the time of the operation, but the teeth were strangulated,

without extravasation, and the discoloration did not show until later. In this case, had the operator extracted some teeth, the third molars would have erupted, and would probably have become good, useful teeth, and the entire arch would no doubt have perfectly occluded.

Referring to Fig. 13, the essayist has demonstrated what all of you who are at all observant must have noticed many times, viz, that a child will often inherit the teeth from one parent and the jaw from the other. In a race like ours, which is so mixed, it is difficult to determine just what a typical case may be. I should call a typical case one where the teeth occlude perfectly with each other irrespective of appearance or regularity. I believe that Dr. Kingsley's great success was due to his judicious extraction of teeth, and if you will note his work you will find that in many instances he has extracted; and in fact, wherever the lateral incisors were far in the mouth he would extract. I have done this in my own practice, and believe that the mouths of the patients show profiles in which the lines are nearly if not quite perfect. At the same time the patient has a cleaner mouth, there is less pressure, and in such cases the third molars are of service to him. (In the case represented in Fig. 18, Dr. Kirk removed the first permanent molars on account of their being poorly developed, the resulting profile being good.)

Figs. 19 and 20 illustrate a very interesting case, certainly, and I doubt not that many of you have noticed similar instances in your own practice. I believe the doctor's diagnosis is absolutely correct. In this case it would have made but little difference had the teeth been allowed to remain in the mouth. I have seen central incisors, bicusps, and lateral incisors protruding and even rotating on their sockets where there had been no teeth extracted, and I believe you gentlemen can recall such cases in your experience. This is due, as the doctor remarks, to a deposit of lime salts in the cancellous tissues around the teeth. While the doctor states that nothing can be done unless medical relief can be

given, I do not believe that any relief can be obtained by medication, and doubt, with our present knowledge, whether any relief can be afforded the patient who is suffering under such conditions.

In conclusion, the points to be considered in the regulation of the teeth are—

(1) An intimate knowledge of the anatomy of the adjacent parts.

(2) Care should be taken that pressure is not strong enough to devitalize or injure the pulps.

(3) A proper occlusion should be secured.

(4) No fixed rules can be formulated for the guidance of the practitioner, but each case must be carefully and thoughtfully considered before any effort is made with a view to regulation of the denture.

Dr. F. MESSERSCHMITT, Rochester. In the correcting of irregularities of the teeth we endeavor to obtain the proper occlusion of the teeth and to improve the facial expression of the patient. Good judgment in making a correct diagnosis, skill in constructing appliances, and considerable manipulative ability are necessary to be successful in this special line of work.

As long as some members of our profession persist in trying to correct irregular teeth with appliances purchased at the dental depots, or constructed in mechanical laboratories by someone who perhaps has never seen the patient and knows not what is required, just so long will we see such failures as are alluded to in the doctor's paper. My experience with the dentist who is unable to construct his own regulating appliances has been that he usually manages to get into very hot water about the time he sees the teeth moving toward all points of the compass, and then he thinks he is doing a brother dentist a favor by referring this patient to him.

The conditions the doctor mentions, as well as many cases of pyorrhea, are no doubt brought about by malocclusion, also from ill-fitting and improperly constructed appliances, as well as by injury produced by rubber bands and ligatures which are not held in a fixed position.

All appliances should be so constructed as to afford the greatest amount of anchorage while not producing any injury to the teeth and surrounding tissues.

Though I do not advocate reckless extraction, I never hesitate to extract one or more posterior teeth if the case demands it and a better result can be obtained.

Where the irregularity has been due to nasal or pharyngeal obstruction it would be difficult, if not impossible, to obtain and retain good occlusion unless the cause be removed, for the arch will slowly but surely return to its original shape upon the removal of the retaining appliance.

It would be necessary for one to have heard the paper read to intelligently discuss the various illustrations referred to therein, and I know Drs. Jackson and Carr, and the other members present, will be in a better position and more able to do so than I, for does not the doctor in his paper try to impress upon us the importance of being acquainted with and seeing the various conditions that exist?

Dr. CRYER (closing the discussion). I have very little more to say except to mention a few points with regard to forcing teeth backward, especially in the lower jaw. Of course I believe that mechanical appliances can be used for this purpose, but often with the liability of serious results such as inflammatory conditions, followed by either necrosis, thickening of the bony tissue, enlargement of the roots of the teeth by deposits of abnormal cementum, the solidifying of the cancellated tissue which becomes attached to the cortical bone, impacted teeth, neuralgia, etc. I have seen patients roll upon the floor with neuralgia, so intense was the pain, and have been asked by them, when about to administer an anesthetic for the operation, "If you cannot cure me, do not let me regain consciousness," and I know that some of the above results are due to injudicious methods of practitioners. Therefore I feel that every effort should be made by the dentist to know more about the physiology and anatomical structure of the jaws, and the pathological conditions

liable to be brought about by improper treatment and interference with the physiological functions.

Dr. Jackson spoke of the teeth of the present generation. There is not time to go into detail on this subject, but I am ready to discuss the question, and to prove that the teeth and jaws of the present day are as good as those of three thousand years ago. In fact, I can show better teeth and more perfectly formed jaws than can be found in the skulls of the ancient races. There is not a year that I do not find jaws, both upper and lower, with perfect teeth—sixteen upper and sixteen lower—and occasionally eighteen teeth in the upper jaw. But some dentists say, "I do not see these cases." No, as a rule, they do not. Why? Because people having such teeth and jaws do not require the services of a dentist. By careful calculation it has been learned that about eight hundred thousand people in the city of Philadelphia never visit a dentist. It is among these people that such teeth and jaws may be found.

On motion the subject was passed, and Dr. I. L. M. WAUGH, Buffalo, read a paper on "The Alveolo-Dental Membrane." (Published in full at page 744 of the September issue of the *Cosmos*.)

The discussion of Dr. Waugh's paper was deferred until a later session.

SECOND DAY—*Morning Session.*

The meeting was called to order at 10 o'clock, and the deferred discussion of the paper by Dr. Waugh was taken up.

Discussion.

Dr. J. I. HART, New York. I regret very much that I did not have an opportunity to study Dr. Waugh's paper, but while he was reading it some points impressed me, and I shall be very glad to say just a few words on the subject. A thorough knowledge of the tissues under consideration is essential to a complete understanding of the pathological conditions which we are called upon to treat, and to show you that the profession as a

body appreciates the importance of this membrane, in the two papers which were read yesterday, one by Dr. Holly Smith of Baltimore, and another by Dr. Head of Philadelphia, both referred to the injury that may be done to this membrane. Dr. Head showed us a crown that would prevent injury to this tissue, one in which no band was required. Dr. Holly Smith indicated how pressure may be brought to bear in gold work without injury to this tissue.

Dr. WAUGH (closing the discussion). There remains but very little for me to say except perhaps that it was my aim to make the paper short, and in covering so large a field a great many details could not be gone into deeply. For example, I said little about the interfibrous constituents, which have rather an important bearing, hoping that these and other elements might be elaborated upon in the discussion. I appreciate the lamentable fact that a paper on histology, even in its practical application, does not appeal in a great measure to the general dental audience, hence my special effort at brevity.

The next order of business was a paper by Dr. C. W. STANTON, Buffalo, on "Our Society: A Study and an Appeal," which was by special request of Dr. Stainton deferred until the next annual session, and was made a special order of business to follow the President's address at that time.

The next item on the program was a paper by Dr. W. J. TURNER, Brooklyn, on "The Patient's Part in Keeping the Mouth Clean." (Published in full at page 734 of the September issue of the COSMOS.)

Dr. WHITE. Before the discussion of Dr. Turner's paper I would like to offer the following resolution:

RESOLVED, That we the Dental Society of the State of New York do hereby extend to Dr. E. N. Jenkins of Dresden, Germany, our hearty thanks for the very valuable paper which he contributed for the meeting of 1904, and that the Secretary be instructed to convey the thanks of the society to him in writing.

R. H. HOFHEINZ, *President*.
W. A. WHITE, *Secretary*.

Discussion.

Dr. E. T. DARBY, Philadelphia. I would like first of all to compliment Dr. Turner on his paper. The subject of cleaning the mouth is an interesting one to us all. We all like to work in clean mouths. There is nothing that appeals to me more forcibly than the clean mouths that I frequently meet with in my practice, and I never lose an opportunity when I find them to compliment patients on the effort they have made to keep them clean. It has been a rule with me, before beginning any operations of filling, to put the mouth in a healthy and clean condition. I do this for two reasons: first, because it is more agreeable to work in a clean mouth, and the other to impress the patient with the importance of keeping the mouth clean. And in this connection I am reminded of what Dr. Waters of Boston said years ago in the National Dental Association, when we were discussing the care of children's teeth. On the previous day he had had an experience, he said, that made him feel good. As he was walking up and down the platform at the station at Lowell waiting for the train, a fine-looking man of about forty years of age walked up to him, and, extending his hand, said, "I believe this is Dr. Waters of Boston." He said, "Yes, but I do not recognize you." He said, "No wonder; you have not seen me for twenty-five years. When a boy my mother sent me to you to have my mouth attended to. You looked into it and said, 'Young man, I don't want to put my fingers in your mouth; it is too filthy. If you will go home and brush your teeth for two or three weeks, and then come back, I will look at your teeth.' I was so mortified that after I did get my teeth fairly clean I went to another dentist to have them attended to." And, opening his mouth, he said, "Did you ever see a cleaner set of teeth than that?" "Yes," I said, "they are clean." He insisted that I examine them carefully, and repeated, "Did you ever see a cleaner set than I am showing you?" I said, "Yes, they are certainly very clean indeed." "I am indebted to you," he said, "for the

lesson you taught me." When I see children careless about keeping the teeth clean—too busy to do it, as they say—I tell them this story, and often good results follow. It has been my practice with new patients to make them thoroughly cleanse the mouth before I attempt any operation in filling. Perhaps I do not do it as thoroughly as Dr. Smith, but I go over the teeth as carefully as I know how. When I am through, the patient is impressed with the importance of a clean mouth.

Dr. Turner spoke of the importance of thoroughly washing the mouth. He also mentions the value of a powder. I have been in favor of the use of powder for the reason that the slight abrasive quality in it is needed by most teeth. I have told my patients to clean their teeth as they would their silverware; to use a fine, impalpable powder, and polish every part with brush and powder. I do not agree with Dr. Turner that fine pumice (unless precipitated) should be used in the mouth. Some people brush their teeth four and five times a day, using powder each time. I have in my practice a number of patients that have been using a powder made by an eminent druggist of our city who has been in the business for forty years. He makes a powder containing among other ingredients cinchona bark and pumice. I find that patients who have used this powder for a long period have tooth-brush erosion. In the past thirty years I have seen many such cases, and I have requested the patients to substitute other powder.

A powder should be of such a nature that it is insoluble in the fluids of the mouth. Again I think a powder should be of a saponaceous character. A good powder is composed of pulverized Castile soap, prepared chalk, and orris root. I have found that soap in a powder is very desirable. As Dr. Turner said, if soap be good on the hands, it must be good in the mouth. It has a cleansing quality, and does away with the ordinary dryness of the powder. In regard to the flavoring, that is a matter of individual taste.

Washes, I think, should be used as Dr. Turner has told us—plenty of the wash

combined with a good quantity of water. The water should be tepid, or rather warm than cold. If one will take a whole mouthful of water combined with an antiseptic of sufficient strength, by distending the muscles of the cheeks, forcing the fluid back and forth between the teeth, that act alone will go a long way toward cleansing the mouth.

Dr. C. F. BUNBURY, Rochester. I must say that prior to reading Dr. Turner's paper I do not think I ever thoroughly instructed a patient about cleansing the mouth. Being young, and somewhat inexperienced, I am of course not capable of discussing the paper at all, but there are one or two points I would like to offer. With regard to brushes, I recommend to a great many patients to cut off the bristles of an ordinary brush leaving about a quarter of an inch at the end, and that is very helpful in cleaning the spaces between the teeth. I also recommend to patients who have an inclination toward pyorrhea one of the little Berlin abscess syringes for syringing between the teeth, and in this way they can clean them thoroughly. Recently the glyco-thymoline people have gotten out a glass syringe that is very inexpensive, and serves the purpose very nicely.

I have nothing further to say, except that the paper has been a revelation to me and has urged me to instruct my patients better in the future than in the past with regard to cleansing the teeth.

Dr. A. C. RICH, Saratoga. One little point occurs to me that may be of value to some who have not followed this plan: I ask my patients how many times they use a powder when they are brushing their teeth—how many times they put powder on the brush while cleaning the teeth; and nine out of ten will tell you that they simply put the powder on the brush once and brush their teeth. I tell them to use it several times. They certainly cannot get around all the teeth with one brushful of powder. Now, the directions which I give to patients are, that they will first put powder on the brush to brush on one side, and put on more powder to brush the other side, and then more for the masticating

surfaces, until they have reached every portion of the mouth with powder and brush.

Dr. TURNER (closing the discussion). There is nothing special that I would like to add to the paper, except to say that pumice as an ingredient of a tooth-powder is recommended only when considerable accumulations of tartar occur upon the teeth in spite of faithful and intelligent care to prevent the same. I think that as a rule there is sufficient abrasive quality in prepared chalk.

Dr. BUTLER moved a vote of thanks to the retiring President and Secretary for

the successful manner in which they had conducted the meeting.

The motion was carried.

Dr. HATCH, chairman of the Committee on Research Work, asked that the members in person or by letter express to the committee the subjects in which they were most interested, so that the committee might be guided by these opinions in their research work.

There being no other business before the society, the President declared the meeting adjourned until the next annual session.

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Devoted to the Interests of the Profession.

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EDWARD C. KIRK, D.D.S., Sc.D.

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PHILADELPHIA, OCTOBER 1904.

EDITORIAL DEPARTMENT.

THE GAIN ACHIEVED.

"THERE can be nothing more irrational than professional jealousies,—the jealousies of one profession toward other professions, and the jealousies of one section of a profession toward other sections in that profession. Let us flout and scout all such jealousies. It is the ideal of a university to form what has been called the liberal mind, and the liberal mind is impatient of all that is petty and narrow. It realizes the catholicity and the identity of feeling that are bent on unity for the sake of unity, but always with a view to usefulness."—VERY REV. MARSHALL LANG, *Principal of the University of Aberdeen.*

THE movement originated at Niagara Falls in August 1902 by a resolution of the National Dental Association initiating the Fourth International Dental Congress has successfully culminated at St. Louis. All who contributed to the result may contemplate with feelings of peculiar satisfaction the fact that they helped to create the greatest international congress of dentistry in the history of our profession. It was great at all points: in the number of its members, sixteen hundred approximately; in a program which faithfully set forth the latest development of dentistry in all its phases; in its clinics; in its exhibits, and in its social features. Twenty-eight countries were represented at the Congress by delegates, so that in its international character the Fourth Congress surpassed all of its predecessors.

The material benefits to the dental profession which will flow from this great gathering cannot yet be appreciated. The published Trans-

actions will comprise the record of all that was done and place it in available form for those who have as yet gained but a general and superficial idea of the work in its entirety. Indeed, no more than a superficial impression of the work could be obtained even by those who were in attendance and gave systematic attention to it; for the simultaneous sessions of ten sections made a comprehensive grasp of the Congress by any individual impossible. The publication of the completed record will be a setting forth of the status of the whole range of dental advancement up to the time of the St. Louis meeting—a record of which every member of the dental profession may well be proud.

But, satisfactory as the material results of the Congress may prove to be, and indeed are, the influence of the meeting upon the organic life and social relations of dentistry is yet more important and satisfactory.

At the inception of the movement conflicting views arose as to the basis of organization. It was necessary to affiliate and harmonize the conflicting elements upon the plane of greatest advantage to the dental profession as a whole. The international feature at once brought the work of organization into connection with the objects and purposes of the *Fédération Dentaire Internationale*, an association for the promotion and unification of international dental relationships created at the Paris Congress of 1900. The formative stages of the F. D. I. had not yet been passed. The definition of its objects and aims had been stated with much more clearness than the formulation of the methods by which its ends were to be attained. Hence the articulation of the work of the Congress organization with the plans of the F. D. I. became a matter of no little difficulty, necessitating a revision of the position of the latter body and the formulation of its objects and methods in terms of such specific clearness as would remove all doubt concerning its objects, and as would at the same time specifically define its powers, and especially its relations to national questions, in a manner acceptable to all parties in interest.

In the course of its deliberations the fact became evident that an organization having for its object the promotion of dental interests in an international way must be safeguarded against any tendency toward interference in national affairs, or of "arousing national susceptibilities," as was clearly stated in the address of President Godon at the Stockholm meeting. But while the sentiment of the Federation in this respect was doubtless faithfully voiced in the address referred to, yet neither the constitutional articles nor its by-laws contained any clear and unmistakable declaration limiting the powers of the F. D. I. to that of an advisory body. The lack of such a declaration created for the time being a feeling of uncertainty as to the attitude and relation which the F. D. I. might legitimately bear to the work of organization of the Fourth International Dental Congress and of future congresses. The committee appointed by the National

Dental Association and ratified by the directory of congresses of the St. Louis Exposition held to the conviction that it was fully empowered to proceed with and complete the work of organization, and in this belief it was sustained by the National Association. On the other hand, the F. D. I. contended that the National Dental Association having a delegated representation in the F. D. I., and further that the Paris Congress having decided by vote that the F. D. I. should be charged with the authority to organize the Fourth Congress, therefore that body should have equal power in the work of organization. In this latter view the National Dental Association did not concur, and at its Asheville meeting instructed its delegates to limit the affiliation of the national body with the F. D. I. strictly within the lines of "an international advisory council."

At a meeting of the Executive Council of the F. D. I. held in Paris during April last, a new set of regulations was agreed upon for presentation to the St. Louis Congress, and among them a definite and clear declaration specifically limiting the powers of the Federation to those of an international advisory council. These new rules and regulations were finally adopted by the St. Louis Congress, and will be found published in full at page 843 of this issue. Not only has the one cause of difficulty thus been removed, but the F. D. I. is now placed in such position with respect to its national affiliations that it must become the part of wisdom for the representative dental body in each nation to exert its influence through the *Fédération Dentaire Internationale* for the uplifting and development of dentistry as a whole. It is this result, the perfecting of an organized plan by which questions of international import may be solved and by which the value of the service of dentistry to humanity may be effectively increased, that is the great achievement of the Fourth International Congress.

We have placed at the head of this article a quotation from Principal Lang's address of welcome to the British Dental Association at its Aberdeen meeting. It may serve to characterize the result achieved at St. Louis, and we trust also as the *motif* of dental professional progress for the future. The irrational is the ignorant, and in proportion as the light of knowledge has been shed upon this great work of international organization so have the evidences of irrationalism, with its excrescence of professional jealousy, diminished. There is the professional mind as there is the individual mind, and those characteristics which we call liberal in the mind of the individual may by growth and by common consent become the attributes of the professional mind. If it be "the ideal of the university to form what has been called the liberal mind," it is no less the tendency of the broader outlook on things—the universality of effort directed toward the accomplishment of a common purpose by united effort—to create the liberal professional mind. The adjustment of national

relations through the International Dental Federation as accomplished at the St. Louis Congress has placed before us a definite and effective plan by which the irrational in our world relationships may be done away with, and our professional fabric founded in that "catholicity and identity of feeling that are bent on unity for the sake of unity, but always with a view to usefulness."

A CORRECTION FROM DR. W. S. HOW.

TO THE EDITOR OF THE DENTAL COSMOS: *Dear Sir,*—On page 659 of the August 1904 issue of the COSMOS the sentence, "The round porcelain inlay operation—originated by Dr. Wm. Storer How of Philadelphia in 1867. . . .," is incorrect, inasmuch as my name in full is Woodbury Storer How, and the date of the original article is 1888, as published in the August DENTAL COSMOS of that year. The erroneous date is, however, the only adequate reason for directing attention to the misinformation.—Yours truly, W. STORER HOW, Philadelphia, August 10, 1904.

NOTICE.—The Congress Souvenir Medal.

A CONSIDERABLE number of these artistic and interesting souvenirs of the Fourth International Dental Congress are still available for those members who may desire to obtain them. They may be had upon application to Dr. Chas. S. Butler, Chairman of the Finance Committee, 680 Main street, Buffalo, N. Y., who can also supply a limited number of the official medals of the World's Columbian Dental Congress of 1893. The price of both is five dollars each.

EDWARD C. KIRK, *Secretary-general.*

BIBLIOGRAPHICAL.

DUNHAM'S NORMAL HISTOLOGY: A TEXT-BOOK ON NORMAL HISTOLOGY FOR THE USE OF STUDENTS AND PRACTITIONERS OF MEDICINE. By EDWARD K. DUNHAM, PH.B., M.D., Professor of General Pathology, Bacteriology, and Hygiene in the University and Bellevue Hospital Medical College, New York. New (3d) edition, revised and enlarged. In one octavo volume of 334 pages, with 260 illustrations. Philadelphia and New York: Lea Brothers & Co., 1904.

The general plan and scope of this outline of histology are, to quote the author's own words, the result of experience in teaching the subject to students of medicine under conditions which require economy of time.

The book is divided into nineteen chapters, and in their contents the student will find accurate and descriptive information on the microscopical anatomy of all the tissues of the body. It must be said, however, that in some instances these narratives have been so much con-

densed as to make an understanding of them most difficult to say the least. In turning to the chapter in which the structure of the teeth is analyzed, we find that the whole subject has been covered in one and a half pages. When that is said, it becomes superfluous to state that this particular phase of the topic is but meagerly discussed, and that from its perusal no dental student could derive any benefit whatever.

None of the three hard or two soft tissues which together enter into the formation of the tooth is described in

accordance with text-book standards, in the sense that the matter has been boiled down to its simplest expression.

The book will doubtless prove of value to medical students, and also to dental students in so far as general histology is concerned; but it will be found unavailable, we fear, as a guide for advanced students of dentistry.

It is useless to comment on the make-up of the work—it being in every respect in harmony with the adopted standards of the publishers.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Revue Odontologique*, Paris, August 1904.]

LOCAL ANALGESIA WITH STOVAIN. BY
PROFESSOR PAUL RECLUS, PARIS, FRANCE.

The eminent physiologist, Dr. Billon, has recently shown that "stovain," the new local anesthetic discovered by Mons. Fourneau, the distinguished French chemist, is twice less toxic than cocain. Since October 1903, Professor Reclus has been testing the effects of this new agent upon man, and after nine months of continuous observation ventures to publish the report under review. He has found that the anesthetic power of stovain is identical with that of cocain, and that when carefully injected both agents have the same power of abolishing sensation.

Regarding the toxic action of stovain as compared with that of cocain, the author states that at the beginning of his investigations with cocain, in 1886, he found that five per cent. solutions of that drug would occasionally give rise to serious systemic disturbances, and that since using solutions of two to one and one-half per cent. these physiological disturbances have been sensibly decreased. With stovain he has not observed any disagreeable after-effects, and believes with Dr. Billon that when injected in man stovain is less toxic than cocain. It is perfectly safe

to hypodermically inject stovain even in greater quantities than cocain. Under its influence, the author has been able to perform a number of serious and long operations, such as the removal of large-sized tumors and the reduction of umbilical hernias.

The author believes that stovain may be available in connection with the performance of the following operations: Circumscribed cutaneous and subcutaneous tumors, lupus, lipomas, fibromas, amputations of the phalanges of the fingers and toes, ingrowing nails, gastronomies, laparotomies, for the removal of ovarian cysts, etc. Incidentally the author states that two-thirds of his operations are performed under the local influence of stovain.

Stovain is a vaso-dilator instead of a vaso-constrictor as is cocain. This presents both advantages and disadvantages. One of the inconveniences is that the field of operation is kept constantly filled with blood, but this slight disadvantage on the part of stovain is more than compensated by the effect of the agent upon the bloodvessels supplying the brain. When operating under cocain, it is the invariable rule to keep the patient in the horizontal decubitus, as it is impossible to operate with the patient in the sitting position. With stovain it will be possible to operate with the patient in the chair, thus

greatly facilitating surgical work in the mouth and head.

[*l'Odontologie*, Paris, August 30, 1904.]

THE PAINS OF DENTITION. EDITORIAL.

The editor of *l'Odontologie*, quoting from an editorial article in the *Journal des Praticiens*, states that those accidents which are occasionally observed in connection with the eruption of the teeth are signs of local nervous irritation, and that such symptoms as salivation, redness of the gum, restlessness, insomnia, are corroborative signs.

He farther on states that parents occasionally request the attending physician to lance the gum, and declares that this kind of intervention is not only useless, but at times detrimental.

To anyone having had any experience in the care of infants' mouths, the latter statement must certainly appear as both unfounded and incorrect. Coming from a medical writer, we should have tried to overlook its fallacy, being by this time familiar with the trend of thought of a number of physicians on this question of vital importance to infants, but as his opinion appears to be indorsed by the editor of a dental publication we cannot for a moment consider it right or just to refrain from expressing our views, which, by the way, are the result of both pathological observations and actual clinical experience.

The main cause of the number of complicated systemic disturbances concomitant to difficult dentition lies in the undue degree of pressure, not upon the covering gingival tissue, but against the unprotected and highly sensitive pulp. The pain and irritation which is thus established gives rise to nervous disturbances, which in turn lower the vital resistance of the infant, thus predisposing it to a number of diseases of infectious character. It is in this way that we can account for the serious digestive troubles which almost always accompany the difficult cutting of the temporary teeth.

The writer is aware of many cases in which infants were almost instantaneously relieved through gum lancing, and is fully in accord with the method advocated by progressive pediatricists to the effect that the gum should be lanced as soon as signs of local irritation appear. His experience is confirmed by that of many other dental practitioners who have successfully treated infantile disturbances due to difficult dentition by the lancing of the gingival region covering the inclosed teeth.

The parallel between the physician who refuses to recognize the necessity of lancing the gum in these cases and the dentist who administers chloroform for the extraction of a tooth is complete.

[*Les Annales Dentaires*, Paris, August 1904.]

HYDROGEN DIOXID IN MEDICO-CHIRURGICAL THERAPEUTICS AND IN DISEASES OF THE MOUTH AND TEETH. BY E. TOUCHARD, PROFESSOR AT THE ECOLE DENTAIRE, PARIS.

The author states that H_2O_2 , notwithstanding its antiseptic and hemostatic properties, does not yet occupy in general therapeutics the place to which it is justly entitled. It was at the beginning of the past century, in 1818, that H_2O_2 was discovered by Thénard, and the method employed by him at that time for its preparation is the one to which even now the preference is given by manufacturing chemists.

Since Thénard's discovery, chemists have repeatedly investigated the properties and uses of oxygenated water in France as well as in other countries.

Reviewing the literature of the subject, Mons. Touchard refers to the communication by Langier to the Academy of Science in 1862, to the thesis of Raynaud in the same year, to that of Foueras in 1866, and to the works of Jules Guérin, Demarquay, etc.

The bactericidal properties of hydrogen dioxid were studied by Smyth in 1869, by Kingzett in 1876, by Day in 1877, by Guttman in 1878, who found that one cubic centimeter of a ten-volume solution of hydrogen dioxid prevented during nine months the decomposition of ten cubic centimeters of urine, and furthermore, that it had the power of preventing the putrefaction of an infusion of meat. In 1881 Damaschino treated successfully several cases of thrush by means of tri-daily irrigations with hydrogen dioxid solution. His favorable results served as the basis upon which Doreau prepared his thesis in 1881. Such eminent investigators as Paul Bert and Regnard took up the study of this compound in 1880, and found that a one per cent. solution would arrest putrefactive decomposition in milk, egg albumin, starch, etc., and other experiments upon fibrin showed that the compound is capable of arresting the growth and development of vegetable ferments. In 1881, Baldy discovered in the course of his investigations the anti-putrid action of oxygenated water, as well as its arresting influence upon

morbid processes of purulent nature. In 1882, d'Ollivier advocated the employment of H_2O_2 in the treatment of wounds. In 1883, Nocard of the veterinary school of Alford and Molereau, discovered that hydrogen dioxide attenuates the virulence of symptomatic anthrax, and that the degree of attenuation obtained is in proportion to the length of the application.

The author also refers to the work and observations of Sinetty in 1882, Barbolain in 1884, Betmann in 1885, to those of Altehofer, Pane, Gibier, Heidenhain, in 1890, and to the interesting pamphlet published in 1893 by Chamberland and Fernbach in the annals of the Pasteur Institute.

It was while studying the action of dioxids upon acids that Thénard observed that a part of the oxygen of the dioxid remained in the solution. It is prepared by the action of barium dioxid upon hydrochloric acid. By means of this process it is possible to obtain an oxygenated water containing 475 volumes of oxygen, but for medical and surgical use one would employ a solution of not over fifteen volumes. Its density is of 1.452; its reaction neutral or slightly acid. It is not rendered solid even at a temperature of $-30^\circ C.$, and is easily soluble in water. Hydrogen dioxid is easily decomposed by contact with the air, and while the saturated solution is changed at a temperature of $20^\circ C.$, that containing seven or eight times its own volume of oxygen may resist a temperature of $50^\circ C.$

The author then gives a long list of agents which easily decompose H_2O_2 , and takes up the question of tests, stating that the presence of hydrogen dioxid may be detected by means of the test advocated by Schoenbein. It consists in adding to a solution of starch a few drops of a solution of potassium iodid, then a small quantity of the solution to be tested, and finally, a drop of a ferrous sulfate solution. An iodid of starch is produced, and the blue coloration is deeper the stronger the proportion of hydrogen dioxid in the solution. The reaction is due to the decomposition of potassium iodid by the agency of H_2O_2 , and the iodine thus liberated combining with the starch produces the characteristic blue coloration of iodid of starch. Other tests that may be employed to detect the presence of hydrogen dioxid are the potassium permanganate test; by adding a solution of hydrogen dioxid to one of potassium permanganate the red color of the permanganate solution disappears. The chromic acid test, which consists in acting upon a one per cent. solution of chromic

acid with the H_2O_2 solution, brings about a changed color from orange yellow to blue. If the proportion of H_2O_2 be too small, producing only a slight change in color, the mixture may be shaken with ether, which will dissolve the perchromic acid and give a deep blue color.

The author then takes up the question of dosage and of the agents that may be added to hydrogen dioxid solutions in order to insure their preservation. Alcohol has been advocated for this purpose, and the experience of the author confirms the claim that the addition of a slight quantity of alcohol prevents its decomposition.

The author concludes his communication, referring in detail to the investigations of Dr. Gellé, who has found, first, that neutral hydrogen dioxid is easily decomposed; second, that the quantity of acid added to hydrogen dioxid solutions does not insure its preservation, as it was found that a sample containing 17.15 grams of free acid contained only 4.9 times its volume of oxygen, while another sample which contained 0.45 grams of free acid, contained 10.63 volumes of oxygen.

[*Items of Interest*, September 1904.]

FIVE AND A HALF YEARS' FURTHER TREATMENT WITH PULP-MUMMIFICATION. BY DR. J. A. WAAS.

The author reports upon the result of his experience with mummifying pastes in two hundred and fifty cases, and, incredible as it may seem, he has as yet to record a single case of failure. The assertion has been made, the author says, by some of the oldest and best practitioners, that very frequently the apical ends of pulps remain in the canals for years without causing trouble, and therefore asks, Why should we not let the pulp remain as a natural root-filling in a hardened, dry, and uninfected state?

The reviewer, without in any way desiring to question the author's statements, ventures, however, to republish in this connection his views on the subject as contained in a short article printed at page 82 of the *DENTAL COSMOS* for January 1903. We at that time stated that "All pulps cannot be tannified, inasmuch as in some cases the intensity of the infection may be such as to bring about the disorganization of the pulp-constituents long before the mummifying process sets in, and the consequences would then be just as detrimental and the pericemental infection just as acute." We do not underestimate the clinical value of Dr. Waas' exceptionally fortu-

nate experience, but we do want to introduce a word of warning in the sense that we fail to see why indiscriminate preference should be given to a method which is absolutely contrary to the basis of rational therapeutics. That it is applicable in isolated cases we fully understand and appreciate, but we are positively opposed to its being made use of in that larger number of cases in which the mechanico-therapeutic method is decidedly the best, the surest, and the most effective. The mummifying method should be understood to be one of necessity and not of choice.

[*l'Odontologie*, Paris, August 30, 1904.]

DENTAL OPERATIONS IN PREGNANT WOMEN. BY DR. J. CHRIST.

According to the observations of this author, dental operations, such as extractions, etc., may be performed in pregnant women without fear of dangerous results. Even the psychic state induced in the patient by the preparation necessary for the operation has no bad influence on the patient's state, if otherwise healthy.

[*Medical Progress*, Louisville, September 1904]

THE TONGUE AS A DIAGNOSTIC GUIDE.

BY DR. J. W. NIEWEG.

The tongue, aside from being the organ of taste, phonation, deglutition, suction, and mastication, is the bulletin upon which may be read the events that are transpiring within the body. We examine the tongue to ascertain if it be dry or moist, clean or furred, hard or flabby, pale or red. There are many conditions that will cause the tongue to become furred. Among them may be mentioned febrile conditions, hepatic disorders, disturbances of the stomach and intestines, or local causes, such as carious teeth, neuralgia of the terminus of the maxillary branches of the tri-facial, enlarged tonsils, etc. Sometimes the tongue will only be furred upon one side. In such cases we should always look for local trouble affecting the side corresponding to that of the coating on the tongue. Another not infrequent local cause is the excessive use of tobacco. If we can eliminate all of the local causes, and if there be no accompanying fever, we can specially attribute the fur to some disturbances in the *primæ viæ*. Often patients with a thickly furred tongue complain of a bitter taste in the mouth, especially in the morning. In such cases temporary relief can be obtained by frequently rinsing

the mouth with some antiseptic solution. Potassium permanganate acts well in this connection. A dry tongue generally indicates a nervous depression. It is often accompanied with delirium of a low muttering type, especially in typhoid fever.

There is a tendency for the tongue to become dry in the aged, even without any febrile disturbances.

Another type of tongue which we often encounter is the dry, smooth, glazed, or shiny beef-looking tongue. It is normally clean, and in no other disease is it so constantly present as in advanced diabetes. Sometimes we meet the above described tongue with a few prominent papillæ dotted here and there about the tip. This is the irritable tongue, the name corresponding with the state of the alimentary canal. It is often met with in dyspeptics, alcoholics, in tubercular conditions of the intestines or peritoneum, or, in fact, whenever there is a source of irritation to the alimentary canal and its immediate attachments.

Another tongue often seen is the "strawberry tongue," which is characteristic of scarlet fever. It usually makes its appearance a few days after the onset of the fever, and is due to a desquamation of the cuticle of the tongue leaving exposed the filiform papillæ.

Sometimes we meet with a tongue that is slightly coated and covered with a slight froth, most marked near the edges. It is seen in persons with a nervous temperament, in enervated conditions from overwork or excessive mental strain—in fact, whenever the nerve energy is below par. A broad, pale, flabby, teeth-indented tongue denotes anemia and a relaxed condition of the tissues of the body. This tongue must not be confounded with the swollen teeth-indented tongue due to mercurial salivation.

Another tongue that usually gives us considerable alarm is the septic tongue. The characteristics of this tongue are a dry and dark dorsum and red edges. It may or may not be swollen. It may be due to general systemic infection or local absorption of septic deposits about the teeth. This tongue may be considered as a grave prognostic indication.

There are many other conditions, the author states, in which the tongue acts as a valuable guide in diagnosis; for instance, the tremulous tongue seen in various forms of nerve diseases; again, the tongue of whooping-cough, with ulcers developing upon its under surface.

[*Dental Review*, September 15, 1904.]

THE CONTACT POINT. BY J. E. AIGLEY,
FARMINGTON, ILL.

The author makes the claim that the contact point is second in importance to none of the other subjects which the dentist may be called upon to consider. Furthermore he makes the unqualified statement that the loss of the proper contact point and the failure of the dentist to reproduce it in a proper manner is responsible for more discomfort to patients, for the destruction of more teeth, and the failure of more fillings, than all other causes combined. The contact points afford very little opportunity for lodgment of food particles, and if this condition can be maintained, or if the lost contact point can be restored there will be very little danger for caries to develop in the approximal surfaces, provided, however, that the teeth are otherwise hygienically cared for.

This paper constitutes a forceful plea for the proper contouring of broken-down teeth, and the views therein expressed are fully in

accord with the methods of tooth-restoration advocated by our experts in that branch.

[*Journal für Zahnheilkunde*, April 1903.]

ETIOLOGY AND TREATMENT OF BUCCO-LINGUAL LEUCOPLAKIA. By DR. BOCK-HARDT.

The author has observed sixty cases of bucco-lingual leucoplakia exclusively upon men. All were syphilitics and smokers. The author therefore insists that these two factors play a responsible part in the production of this disturbance. However, the treatment of leucoplakia does not respond to anti-syphilitic medication; on the contrary, this at times aggravates the intensity of the disease.

The treatment should consist primarily in the abandonment of the smoking habit, and in daily frictions of the diseased areas with balsam of Peru. The author records several cases of complete cure in from six months to one year's time, to such an extent that in certain patients the tongue regained entirely its original normal aspect.

PERISCOPE.

Toothache due to Pregnancy or Debility.—Toothache due to pregnancy or debility should be treated with maximum doses of calcium hypophosphite.—*Medical Progress*.

Fusing of Platinum Solder.—The fusing of platinum solder is made very simple by using a cylinder of N_2O instead of the bellows or compressed air. Attach it to the air-nozzle of the blowpipe, and an S. S. W. tooth, or a small piece of pure platinum, can be fused in a few seconds.—R. J. HUSBAND, *Dominion Dental Journal*.

Hygiene of the Gums.—To have good, satisfactory masticating teeth the gums must receive friction—through the food in eating or through rubbing in some manner—to insure perfect circulation. Teeth without gums are denuded teeth, and in many cases they are useless teeth. I look upon the proper care of the gums from the personal standpoint as of as much importance as the care of the teeth themselves.—A. W. HARLAN, *Items of Interest*.

To Determine the Shade of Facings.—Keep on hand a small piece of plate gold, with a slot cut through it large enough to admit the pins of the facing. When selecting a facing place the gold in position on the back, and note the change in color produced by the gold. The edges of the gold should not extend beyond the edges of the facing. If platinum be employed for backing, a thin piece can be prepared in the same manner.—R. L. GRABER, *Dental Review*.

"Don'ts" in the Treatment of Patients. Don't criticize another operator's work in the mouth of your patient.

Don't use soiled towels on your patients.

Don't remove the waste cotton from your tweezers by wiping them on your coat or trousers.

Don't allow your patients to dictate to you too much as to how their work is to be done.—W. CECIL TROTTER, *Dominion Dental Journal*.

Things to Know.—Greenland is one of the very few countries where infectious diseases are unknown.

A white disk a foot across can be seen with the naked eye at a distance of 17,250 feet.

There are twenty-eight pounds of blood in the body of the average grown-up person, and at each pulsation the heart moves ten pounds.

Rice, raw eggs, and venison are the easiest to digest. At the other end of the scale are pork, cabbage, and hard-boiled eggs, which take about four hours to digest.—*Exchange*.

Adaptation of Partial Denture to Remaining Teeth.—When only one or two teeth remain, as the two upper canines for instance, a closer adaptation to the teeth may be secured by slightly trimming the plaster teeth and completely encircling them with soft or velum rubber. Pack the ordinary rubber around this and vulcanize as usual. In finishing use a sharp knife with both the knife and velum rubber wet. A snug adaptation will be attained, with a support superior to that given by clasps, and less harmful to tooth-structure.—P. B. McC., *Internat. Dental Journal*.

Cigar-smoke and Hydrocyanic Acid.—The discovery of prussic acid in various species of plants has awakened considerable interest in the inquiry whether this highly toxic substance is present in tobacco-smoke or not. J. Habermann (Hoppe-Seyler's *Zeitsch. f. physiol. Chemie*, vol. xxxvii, No. 1), finding only contradictory results in the literature concerning this theme, undertook a new investigation, with the following results: In all cases the findings were negative as regards the fumes of cigars, as not even the faintest trace of hydrocyanic acid could be detected.—*Medical News*.

Technique of Mechanical Disinfection of the Hands.—Dr. N. I. Napalkoff (*Khirurgia*, Dec. 1903) describes a method of mechanical cleansing of the hands which he has found of value. The two chief requisites for the thorough disinfection of the surgeon's hands are the care of the hands so as to render them particularly adapted for disinfection, and their mechanical cleansing. The brush is without question the best means of accomplishing mechanical cleansing of the skin, but before use hand brushes should be disinfected by boiling or by steam at high pressure. The great difficulty of handling brushes after they have been sterilized has been a source of comment by many surgeons. It is impossible to take a brush from a receptacle containing a

supply of brushes without contaminating the remainder of the contents, and of course it is necessary for the servant to use a brush before his hands are sterile. In order to overcome this difficulty the author has had constructed a tall metallic box, in which a column of brushes is placed one on top of another. The front wall of the box can be removed when it is necessary to fill. At the bottom of the front wall a door working on springs is provided which is just large enough to allow one brush to come out, and by an arrangement working by means of a pedal the brush is pushed out of the door into the hands of the surgeon ready to receive it. Openings are provided in the box for sterilizing the whole column of brushes by means of steam, and the whole apparatus can be taken apart and boiled.—*New York Med. Journal*.

The Protective Rôle of Human Saliva.—Dr. Miller of Berlin finds that the saliva of man, *per se*, possesses absolutely no protective or antiseptic properties. The sulfoeyanid of potassium, likewise, has no bactericidal action, nor has the buccal mucosa. The saliva contains no cytosines and is not hemolytic. The secret of the antiseptics of the buccal cavity lies in the buccal flora. By simple overgrowth they crowd out and eliminate the majority of saprophytes and pathogenic bacteria. In the diseases of the soft parts, phagocytosis plays an important rôle. Caries is very largely predetermined by the character of the teeth.—*Medical News*.

Direction of the Condensing Force in the Building of Large Contour Fillings.—In building out large restorations and contours the layers of gold should be laid on at right angles to the axis of the tooth, and most of the force of condensation should be applied in the direction of the axis rather than across it. Operators who follow this course, keeping the filling squared up, so to speak, will rarely have fillings cleave off through ordinary wear and tear; but if one gets into the habit of sloping the fillings so that the layers lie diagonally, if there be a weakness in the cohesion or welding there will be greater chances of a break. In building up a brick wall it is kept square or level. If one side was raised a little higher than the other, layer after layer, until there was a slope to the layers the wall would not safely support itself. The same principle is involved to some extent in building up a contour filling. Keep it square up.—R. B. TULLER, *Amer. Dental Journal*.

The Gutta-percha Cone in Root-canal Filling.—The difficulty of root-canal filling is enhanced when there is a large open foramen, but this may be overcome by the use of a section from a long hand-rolled cone of gutta-percha, tapering from one-eighth inch in diameter to a point. As the cone is pressed into the canal the sensation produced will indicate that apical tissue is reached. Withdraw the cone and cut off the end, introducing it again, and repeating the cutting until it can be introduced without sensation. Then cut off a little more, and fasten a section of suitable length on a flat-ended canal plugger by heating the plugger end; next moisten the canal with eucalyptol or chloro-percha and introduce the cone, packing it gently to place. We seldom find foramina so unformed that this method is unavailable.—O. E. INGLIS, *Stomatologist*.

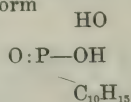
The "Internationalism" of Dentistry.—Dentistry has outgrown its swaddling-clothes, and is now in the period of a strong and lusty adolescence. It has grown into that independence to which it was from the first destined by virtue of its inherent usefulness to humanity. But it has grown otherwise. In the reaching outward of its spheres of influence it has escaped the geographical bounds which limit the activities of nations, and, finding sympathetic response in the touch of the dental professional spirit in other nations, has laid the first foundations for the formation of a dental world power which shall know no national limitations, but which shall regard our calling as of that higher order of truth and knowledge that is the exclusive possession of no country; though native it may be to some, yet withal, a citizen of the world.—EDWARD C. KIRK.

Impressions.—For the best results in constructing any plate denture it is absolutely necessary to have an accurate impression. It is equally true that plaster is the only material suitable for taking impressions of the mouth. I regret that I have not the ability to convince all dentists of this truism. All concede that plaster takes the best impression in certain places. Why? Because it is soft and adapts itself perfectly, is inelastic, and becomes rigid. If a material is the best for the accessible places and the only objection is its fixedness in the difficult ones, and another material is objectionable in the simple cases because of its toughness and lack of rigidity, then it follows as good logic that the more inaccessible the part to be impressed the more essential it is to use the soft, inelastic, and

rigid-forming material. It is only a question of the operator's confidence in self, and dexterity.—GEO. H. WILSON, *Dental Summary*.

A New Method of Soldering.—Take of filings of an easy-flowing solder and filings of the gold to be soldered or some higher fusing metal, about equal parts; also borax and water rubbed up in a mortar or otherwise to make a creamy solution. Mix the filings with sufficient borax solution to make a thick paste. Pack the joint to be soldered with this paste, and heat till fused. Care should be taken that the entire mass is evenly heated throughout, and of course all the ordinary precautions of having surfaces bright and clean, etc., must be observed. This method is especially adapted when large spaces are to be bridged, or where it is desirable to add to a cusp or to contour, or otherwise change the space of a piece in any way. Almost any form desired may be obtained, due allowance being made for shrinkage. The particles of high-fusing metal serve as a support to retain the shape of the mass, and the low-fusing solder acts as a cement when fused to unite these particles and bind them to the piece being soldered.—F. W. STEPHAN, *Dental Summary*.

Turpentine and Phosphorus.—The fact that turpentine is used as an antidote in phosphorus poisoning has caused Minivici to investigate the interaction of the two bodies (*Pharm. Central*, 1904, p. 532). Ten grams of phosphorus, freed from adherent oxidation-product, was cut up under water into small fragments, carefully dried between porous paper, and mixed with 100 grams of freshly distilled French oil of turpentine (sp. gr. 0.865 and boiling at 160° C.). The mixture was warmed to 50° C. for two hours, and the clear solution poured off. It was found that 3 grams of phosphorus had been dissolved. Kept in well-closed vessels no result was observed, but when exposed to the air a precipitate was soon formed, which when separated, washed with petroleum ether, and dried on porous plates was found to be a waxy substance melting at 85° C. It is soluble in alcohol and chloroform. Analysis gave results for the formula $C_{10}H_{15}H_2PO_3$. It is therefore probable that this body is a terpene phosphite of the form



in which one atom of hydrogen in the phosphorous acid has been replaced by the terpene residue $C_{10}H_{15}$.—*Chemist and Druggist*.

To Make Children's Teeth Cut.—According to the quaint work of old Nicholas Culpepper, "Take the tooth of a Colt of a Yeare old, and hang it about the neck of the Child, and this will doe it, if Minzaldus say true. And now give me leave to quote an experiment of my own; one of my children breeding teeth extreme hardly, it seemed to be impossible to get a Colt's tooth (of a yeare old), wherefore I bought a Calves head and took of its teeth and hung about its (!) neck, and the very first night three of its teeth cut, which, because it's very unusuall so many teeth should cut in one night, I cannot but ascribe some virtue to the medicine. Besides all this, I am of the opinion that the Tooth of a dead man hung about the neck of a Child will doe it far better than either. I am not determined to give my reasons at this time, yet will I give you a verisimile for it; the Tooth of a dead man borne about a man instantly suppreseth the pains of the teeth, as I have found mysele, when all other remedies have failed me, and if this be true, why not the other?"—*Brit. Journ. of Dental Science.*

Necrosis of the Jaws.—Necrosis in the lower jaw is more frequently met with than in the upper jaw, a fact most likely due to the greater vascularity of the latter. It is generally the effect of unchecked suppurative periostitis, the pus separating the membrane from the bone, and in this way cutting off the vascular supply, death of the bone occurring rapidly. Necrosis may be complete, involving the whole thickness of the bone, or partial, limited to the alveolar process. The symptoms of impending necrosis are those of periostitis—severe pain, increased heat, rapid swelling—and here much may be done by prompt action, incisions, extraction of teeth, and hot fomentations. After necrosis has been established, the pus finds its way out by the side of loosened teeth, or wells up between the bone and the gum; or it may burrow deep into the neck and point near the angle of the jaw. The pus has the characteristic fetor of that from dead bone. A fistulous external orifice becomes established, and on using a silver probe it comes in contact with the necrosed portion of bone sequestrum.—W. G. ANGLIN, *Dominion Dental Journal.*

Manipulation of Plaster.—It should be saturated with water as quickly and with as little agitation as possible. The more plaster is stirred after setting begins, the more it expands. The plaster should be incorporated into the water by sifting, as this keeps the

whole surface of the water in the bowl covered with the settling plaster. Slight spatulation will hasten the saturation. A very useful implement is a kitchen flour-sieve. It consists of a cylinder of about two quarts capacity, with a fixed handle and a small crank which revolves a horizontal wire frame within a half-globe sieve placed in one end of the cylinder. This implement is improved by having a tinner fasten a funnel, with a two and one-half or three-inch opening, under the sieve, so as to direct all of the plaster into the water, and not a portion outside of the bowl. The bowl and spatula should be kept scrupulously clean. The salt, usually two to five grains by weight to the ounce of water, should be dissolved in the water before adding the plaster, and when the plaster is properly mixed it should be immediately placed in position in the mouth, and carefully, but firmly, supported until the proper amount of setting has taken place.—GEO. H. WILSON, *Dental Summary.*

The Working of Crystal Gold.—All that may be done with foil may be done with crystal gold and with as much perfection, but its peculiarities must be understood, and it must be handled accordingly. Too large a mass must not be used any more than with cohesive foil, but a larger mass may be used in some places than could be consistently used of cohesive foil. When a large mass is used in a large occlusal cavity in a molar, for instance, a large round or oval-faced hand-pressure plugger should be used to press first the center gently, then gradually extending the pressure outwardly until the whole has been condensed, gently at first but in the end as hard as can be, resorting to malleting if one so desire, though very satisfactory hand-pressure fillings can be made, as the cohesion under such pressure is very perfect when due care is used. With the oval-faced plugger, finely serrated, and a rocking motion with hand pressure, very dense fillings may be made and with some saving of time. It stands to reason that if such a spongy mass of fiber or crystal gold be not condensed and caused to cohere thoroughly into a solid mass, its porosity would invite the infiltration of the fluids, and if the filling has been so slightly condensed as to permit of infiltrating, disintegration soon follows and the filling is worthless. If the operator will disabuse himself of the idea—if he has it—that he can plaster crystal gold in a careless and unworkmanlike way, he can then use the substance with a great deal of satisfaction in many places; some operators who do fine work using it to

the exclusion of all other kinds. There are several kinds of crystal gold, and the writer prefers that kind that hangs together rather than the kind that crumbles too easily. The latter is good if it can be confined or held together until pressure brings about cohesion.—R. B. TULLER, *Amer. Dental Journal*.

Headache from Eye-strain.—Of local applications, the simplest, most effective, and least harmful, according to C. A. Wood and T. A. Woodruff (*Med. Standard*, March 1903), are very hot or very cold fomentations. Fold a towel to twelve inches by four, dip into water at 40° F. or at 160° F., and press gently against eyes, forehead, and temples. Repeat every fifteen seconds for five minutes. A soothing collyrium may relieve by its action on the congested conjunctiva, as—

R—Sod. borat.,
Acid. borici, āā. gm. 2 (3ss);
Aque camphoræ, 15 (3ss);
Suprarenal, 0.7 (gr. x);
Aque, q. s. ad 60 (3ij).

Shake well, allow to stand an hour or two, and use the supernatant liquid to drop into the eye.

Another effective eye-water is—

R—Chloreton., 0.1 (gr. jss);
Sod. borat., 0.5 (gr. viij);
Aque, 30 (3j).

A local application to forehead and temples is—

R—Spt. camphoræ, 30 (3j);
Spt. lavandulæ, 90 (3iij);
Alcoholis, 90 (3iij).

Or the following liniment—

R—Chloroform, 30 (3j);
Camphoræ, 8 (3ij);
Tinct. aconiti, 8 (3ij);
Ol. menth. pip., 0.7 (ʒxx);
Alcohol, 60 (3ij).

Temporary relief may usually be obtained from a weak galvanic current.—*Medical News*.

Insertion of Gold Fillings.—Adapting cohesive foil to the walls of a tooth is a different proposition from adapting non-cohesive gold foil, and requires greater care and effort and know-how ability. No extensive mass can be safely adapted to a wall, because of the rigidity it assumes before it is condensed thoroughly, which resists adaptation. Therefore cohesive gold foil has to be used a little at a time, placed here and there about the cavity as required, and condensed thoroughly before

another piece is added. To adapt it to the walls requires careful, painstaking effort with properly shaped instruments; and here is where more operations fail to make a perfect filling than in any other part of the work; for, without fully comprehending how the gold may appear to be tight to the wall when it is not, and that it requires intimate knowledge of all its peculiarities and a special application of skill to overcome its faults, no good preservative work can be done. When gold begins to weld, becoming more and more rigid with every slight movement, it is easily understood how it may bridge from one minute to another, either against the tooth-wall or the surface of gold it is being attached to, and in consequence a filling is made, possibly, full of minute caverns. If the walls are surely hermetically covered, these little caverns would do little harm in the body of the filling until we approach the surface, where the gold must be in absolute contact as each layer is placed, or the finishing will be full of pits, which it should never be. Never can a fine finish be given to a gold filling that develops pits with every sweep of the disks or finishing strips, and all efforts to burnish them out will fail. The only thing to do is to avoid them by making the filling solid by proper condensation in the first place. Another cause of pits is in using pluggers with too deep serrations, and gold that has not the proper cohesive property.—R. B. TULLER, *Amer. Dental Journal*.

Precautions to be Observed in the Administration of Anesthetics.—It is the plain duty of the dentist and anesthetist to defer operation until a careful and thorough examination of the heart, lungs, and urine has been made, for largely upon such examination must rest the proper choice of the anesthetic. This may seem a useless waste of time, but let me emphasize that it is not enough to have our patients survive an anesthetic, but it is now imperative that they survive with the least possible danger of after-effect. To no less degree, however, does the safety of the patient depend upon the cautious administration of the anesthetic than upon its correct choice. It is said that the greatest number of deaths from chloroform have occurred during the reduction of dislocated joints. The reasons for this are twofold: (1) the profound shock, in which condition the patient is found; (2) lack of preparation. Let us, therefore, emphasize the necessity of thorough preparation of the patient. The stomach should be empty and the bowels

should have been previously cleared by a cathartic. The patient should be as far as possible protected from disturbing influences, such as the display of instruments, the cries of other patients, and every assurance should be given as to the outcome of the operation. If the patient be very nervous a hypodermic should be given of strychnin, or strychnin and morphin combined. The chair at which the dentist operates should be made as nearly level as possible; in fact, should have an adjustment by means of which the patient may be inverted in case of emergency. Special caution should also be taken against blood or vomitus being inhaled. The part should be frequently sponged and any clots wiped out. In case of vomiting the patient should be turned so as to provide for the escape of the vomited matter. The anesthetist should have at hand every means of resuscitation, such as stimulants, hypodermics, oxygen, etc.—G. W. MYLKS, *Dominion Dental Journal*.

A Skin Preparation.—A good formula is a *conditio sine qua non*. The formula must have been tried and proved satisfactory. And yet a good, well tried, and proved formula is not all that is necessary; the formula must be well prepared by using the best of ingredients and exercising the utmost skill. Although this preparation is never used internally, still great attention and care should be given to its preparation. A little carelessness may spoil the whole preparation. It is something more than an ordinary mixture. It may be too thin or too thick, a little dark in color, there may be too much perfume, or else not enough. A number of little things may make it not exactly right. Careful work will most likely make it just right.

The following is a good formula; in fact, the best of many that I have tried. It makes a slightly preparation that is pleasing to the user, and invariably proves effective:

Quince seed,	Gm. 45;
Boric acid,	Gm. 30;
Glycerin,	Cc. 600-750;
Alcohol, deodorized,	Cc. 250;
Distilled water,	Cc. 3,000;
Tinc. benzoin,	Cc. 15;
Menthol,	Gm. 0.15
Ext. white rose,	Cc. 10;
Oil of bergamot,	Cc. 1.

Macerate the quince seed and boric acid in the water for forty-eight hours, shaking thoroughly and frequently the while; then strain, add the glycerin, and finally the perfumes, menthol, and tincture of benzoin, all previously mixed with the alcohol.

It is a good idea to carefully break the quince seed in a clean iron mortar, care being exercised not to crush or powder the dark outer coating of the seed, for if this be done the preparation will be darkened by it, and it is greatly to be desired to have it as light in color as possible; if it be white so much the better. It is also a good idea to macerate the quince seed in hot or warm water for a part of the forty-eight hours. It will produce a thicker mucilage, and give body to the finished preparation. Tincture of benzoin is made by macerating the best gum benzoin in pure alcohol—two ounces of gum in twenty ounces of alcohol. Use a good quality of perfume. Of course it need not necessarily be white rose; use any odor that your choice dictates.—J. T. PEPPER, *Amer. Druggist and Pharmaceutical Record*.

HINTS, QUERIES, AND COMMENTS.

FACIAL NEURALGIA.

ON February 2, 1904, Miss A. B. was referred to me for treatment. I found her suffering from severe pain all over the right side of the head, including the ear, eye, and back of the neck. I proceeded to make a careful examination of the mouth, face, etc., and found the motion of the mouth very much impaired. It was with the greatest effort and most severe pain that she succeeded in opening the mouth wide enough for me to insert my finger to make examination.

I found the inside of the mouth apparently healthy; all the teeth of the maxilla on the affected side were present. On the mandible the teeth were also present with the exception of the first and third molars. Pressure caused by my finger rubbed lightly over the space formerly occupied by the third molar would cause almost intolerable pain.

I now proceeded to obtain the following history: In the autumn of 1898 she suffered much pain from an abscessed third molar, accompanied by swelling, etc. After a time the tooth was extracted, it breaking several times in various attempts to dislodge it—the patient insisted that it was at least six times. Severe pain resulted which lasted for several weeks, becoming less and less, but which did not entirely disappear until after the operation subsequently described was performed.

In December 1899, severe pain in the ear, eye, and face caused her physician to fear that another abscess was forming, and so it proved. After a few days it broke on the lingual surface of the jaw, discharging a peculiar dark-colored liquid into the mouth. Another abscess now formed on the jaw, in the region of the first molar, and was incised on the external surface. The patient was now unable to perform her duties for two months, a delay which caused the physician to conclude that the abscesses were due to poverty of the blood. A few months later the pain, which had been present ever since 1898—varying in severity, of course—became almost unbearable, and a dentist was con-

sulted, who decided that the first molar was the cause of all the trouble, and extracted it. A dull pain continued, and a physician was called, who said that in time she would have decay of the bone in this region.

During the winter of 1902 and 1903 the diagnosis made by the physician was neuralgia of the bone, which continued until the beginning of this year.

After obtaining the above history, and making an examination, I decided that the cause was somewhere in the region of the third molar, thinking that the trouble experienced in removing this tooth might suggest—First, a small piece of root remaining; second, an injury to the bone; third a sharp edge of roughened bone causing pressure on the inferior dental nerve, inducing irritation along this branch and by reflex action affecting the ophthalmic and superior maxillary branches of the nerve; then by its relation to the sympathetic nervous system affecting the whole side of the head.

Operation was advised, and the patient consented. It consisted of the following procedures: I made a crucial incision from the ramus to the second molar, dissected back the tissue, and exposed the surface of the bone, which was very rough. I now passed my probe backward along the border of the bone, and it entered a canal near the angle which seemed to extend to the inferior dental canal. I curetted the bone until all the rough surface was made smooth. I next smoothed the inner surface of the canal described above, and washed thoroughly with a solution of glycothymoline, hydrogen dioxid, and warm water. The nurse irrigated this thoroughly every three hours, and packed the surgical opening with cotton saturated with a solution of campho-phénique and orthoform.

There was a small amount of pus present each day for three days after operation, but from the fourth day on there was none. The pain was very severe the day following the operation, and I prescribed Antikamnia and codein 5-grain tablets, two every two hours

for two days. The pain decreased each day after the third day until the twenty-third day, when she was discharged, cured. The pain has now entirely disappeared, and three months have elapsed with no recurrence.

The canal referred to above is not the in-

ferior dental canal, but one probably made by the operator in extracting the tooth.

There was no root remaining, and the trouble was due to a spiculum of bone causing pressure, as before stated.

JAS. E. POWER.

Providence, R. I.

OBITUARY.

DR. MARSHALL D. NISBET.

DIED, at the St. Joseph Hospital, Sioux City, Iowa, August 13, 1904, from cardiac embolism after a successful operation for gallstones, Dr. MARSHALL D. NISBET.

Marshall D. Nisbet was born in Mitchell county, Iowa, September 8, 1868. In his early life his parents removed to South Dakota, and there he grew to manhood. After following various occupations during these years, he had accumulated a sufficient amount to put himself through college, so took up the study of dentistry in 1898 at the Northwestern University Dental School, Chicago, Ill. The second year in college he was made vice-president of his class, and the third year was elected president. He was graduated in 1901 with the highest honors.

He had a successful practice established in Chicago, when he left there and came to Sioux City, Iowa. Here he entered into partnership with Dr. Arthur S. Wasson in November 1901, and had already built up a large and lucrative practice.

He was a member of the Iowa State Dental Society and the Sioux City Dental Association.

He leaves a widow and one child.

At a special meeting of the Sioux City Dental Association, on August 16, 1904, the following resolutions were adopted:

Whereas, The natural course of events has removed from this life Dr. Marshall D. Nisbet, who passed to the great beyond August 13, 1904; and

Whereas, The dental profession recognizes

the benefits received through his having lived and by his life given us an example of a true and courteous professional gentleman; therefore be it

RESOLVED, That in the death of Dr. Nisbet our profession has lost a man of sterling worth, whose progress in the profession was a source of pride to his colleagues, and from whose example all hope to profit; also

RESOLVED, That we condole with his bereaved family, and that a copy of these resolutions be sent to his widow, to the dental journals, and the Sioux City daily papers, and that they also be inscribed on our official records.

ARTHUR SOLVSEBERG,

T. A. ROSE,

A. S. WASSON,

Committee.

DR. ADLER W. STAPLES.

DIED, at Fredericton, N. B., July 31, 1904, at the age of twenty-two, from tuberculous infection, ADLER W. STAPLES, D.D.S.

Dr. Staples was graduated in 1903 from Tufts College Dental School, and was one of the brightest and most promising dentists among the graduates of recent years.

His dental training in the college was preceded by a year's instruction under his uncle, Dr. Barbour of Fredericton, so that upon the completion of the course at Tufts he already had the necessary office experience to assure him a successful future.

His death is being keenly deplored by his friends and *confrères*, who held him high in their esteem as a model young man and an enthusiastic worker.

SOCIETY NOTES AND ANNOUNCEMENTS.

SOUTHWESTERN IOWA DENTAL SOCIETY.

THE Southwestern Iowa Dental Society will hold their eighth annual meeting at Osceola, Iowa, on October 11 and 12, 1904.

J. A. WEST, *Sec'y*, Creston, Iowa.

NORTHERN ILLINOIS DENTAL SOCIETY.

THE Northern Illinois Dental Society will hold its seventeenth meeting at Sterling, Ill., on Wednesday and Thursday, October 12 and 13, 1904. Take due notice and govern yourselves accordingly.

A. W. McCANDLESS, *Pres.*,
A. M. HARRISON, *Sec'y*.

NORTHERN INDIANA DENTAL SOCIETY.

THE sixteenth annual meeting of the Northern Indiana Dental Society will be held October 18 and 19, 1904, at Huntington, Indiana.

It is expected that we will have the largest attendance of any meeting ever held in this section of the country, and you cannot afford to miss hearing such essayists as Drs. G. V. Black, Hart J. Goslee, F. E. Roach, Geo. E. Hunt, Wm. T. Reeves, E. X. Jones, J. Q. Byram, G. E. Johnson, F. R. Henshaw, F. M. Bozer, J. H. Prothero, H. J. Berkey, Lavinia B. McCollum, C. G. Keehn, and many others who have consented to appear on the program, besides a very attractive list of clinics demonstrating all of the newest and most valuable things in practice.

All the leading manufacturers have signified their intention of making an exhibit of their products. Every up-to-date dentist will be present. Are you coming?

Special social features for Tuesday evening. Remember the date.

S. B. HARTMAN, *Pres.*, Ft. Wayne.
OTTO U. KING, *Sec'y*, Huntington, Ind.

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NORTHEASTERN DENTAL ASSOCIATION.

THE tenth annual meeting of the Northeastern Dental Association will be held in Hartford, Conn., October 19, 20, and 21, 1904. Prominent men in the profession have promised essays and clinics. The exhibits will be an important feature. Remember the dates.

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

THIRD AND FOURTH DISTRICT (N. Y.) DENTAL SOCIETIES.

UNION MEETING.

THE fall meeting of the Third and Fourth District Dental Societies of the State of New York will be held at the "New Van Rensselaer," Troy, N. Y., October 18, 1904.

Dr. Edward H. Angle of St. Louis will give an illustrated lecture on "Some Things that Should be Better Known by Both Teachers and Practitioners of Orthodontia."

The committee is arranging an attractive program, and extends a cordial invitation to the profession to be present.

CHAS. E. ALLEN, Albany, N. Y.,
E. B. RHINEHART, Schenectady, N. Y.

FIFTH DISTRICT (N. Y.) AND JEFFERSON COUNTY DENTAL SOCIETIES.

UNION MEETING.

A UNION meeting of the Fifth District (N. Y.) and Jefferson County Dental Societies will be held at Watertown, N. Y., November 14 and 15, 1904. An attractive program is being arranged. Dr. E. C. Kirk, Philadelphia, will be in attendance.

Dentists of northern and central New York are invited to be present.

E. E. HARRINGTON,
Sec'y Jefferson Co. Dental Society.

SOUTHWESTERN MICHIGAN DENTAL SOCIETY.

IN consequence of the meeting of the Fourth International Dental Congress at St. Louis in September, the meeting of the Southwestern Michigan Dental Society stands adjourned until the spring meeting to be held at Kalama-zoo, April 10 and 11, 1905.

C. W. JOHNSON, *Sec'y and Treas.*

BAYONNE (N. J.) DENTAL SOCIETY.

THE dentists of Bayonne, N. J., met at the office of Dr. V. E. Mitchell Thursday evening September 8, 1904, and organized the Bayonne Dental Society, electing the following officers: V. E. Mitchell, president; T. H. Reynolds, vice-president; G. W. Mellor, treasurer; W. H. Mitchell, curator; A. M. Vannatta, recording secretary; A. C. Smith, corresponding secretary; J. S. Ware, financial secretary.

The society will meet the first Friday in each month.

A. C. SMITH, *Cor. Sec'y.*

MASSACHUSETTS BOARD OF REGISTRATION.

A MEETING of the Massachusetts Board of Registration in Dentistry for the examination of candidates will be held in Boston, Mass., October 26, 27, and 28, 1904.

All applications, together with the fee of twenty dollars, must be filed with the secretary of the board on or before October 19th, as no application for this meeting will be received after that date.

Application blanks may be obtained from the secretary.

G. E. MITCHELL, *Sec'y*, Haverhill, Mass.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

AT the annual meeting of the National Association of Dental Examiners, held at St. Louis, Mo., August 25, 1904, the following officers were elected: Thomas J. Barrett, Worcester, Mass., president; Frank E. Moody, Minneapolis, Minn., vice-president from the

West; F. A. Shotwell, Rogersville, Tenn., vice-president from the South; C. Stanley Smith, Cincinnati, Ohio, vice-president from the East; Chas. A. Meeker, Newark, N. J., secretary and treasurer. Committee on Colleges—Charles C. Chittenden, Madison, Wis.; J. A. Hall, Collinsville, Ala.; James G. Reid, Chicago, Ill. Conference Committee—John F. Dowsley, Boston, Mass.; Chas. S. Stockton, Newark, N. J.; H. W. Campbell, Suffolk, Va.

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

MISSOURI BOARD OF DENTAL EXAMINERS.

THE next meeting of the Missouri State Board of Dental Examiners will be held in the Metropole Hotel, St. Joseph, Mo., beginning at nine o'clock Tuesday morning, October 11th.

S. C. A. RUBEY, *Sec'y*, Clinton, Mo.

ILLINOIS BOARD OF DENTAL EXAMINERS.

THE regular annual meeting of the Illinois State Board of Dental Examiners to examine applicants for license to practice dentistry in this state will be held in Chicago, October 13, 14, and 15, 1904. Under an opinion of the attorney-general the following are eligible to take the examination before the board: "Anyone holding a medical diploma from a reputable medical college; anyone who has been a legal practitioner of dentistry for ten years prior to moving into the state, and anyone who failed to register in this state at the time the law went into effect, which was in 1881."

Candidates must furnish their own patients, and come provided with the necessary instruments, rubber dam, and gold to perform practical operations and such other work as is deemed advisable by the board. Those desiring to take the examination should matriculate with the secretary at least ten days before the date of meeting. The examination fee is ten dollars. Any further information can be obtained by addressing

J. G. REID, *Sec'y*,
1204 Trude Bldg., Chicago, Ill.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in dentistry will hold their semi-annual meeting on October 18, 19, and 20, 1904.

Examination in the theoretical branches will be given in the assembly room of the State-house at Trenton, N. J.; practical operative work will be done in Newark before the examiner, at a date assigned by the secretary; practical prosthetic work to be done before the examiner, Dr. A. Irwin, 425 Cooper st., Camden, N. J., on a date assigned by him.

All applications must be in the hands of the secretary by October 15th.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

MARYLAND BOARD OF DENTAL EXAMINERS.

THE Maryland State Board of Dental Examiners will meet for examination of candidates for certificates on November 8 and 9, 1904, at the Dental Department of the University of Maryland, Baltimore, at 9 A.M.

For application blanks and all information apply to

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

OHIO BOARD OF DENTAL EXAMINERS.

THE regular semi-annual meeting of the Ohio Board of Dental Examiners will be held in Columbus, Ohio, November 29 and 30 and December 1, 1904, at Hartman Hotel.

Applications for examination should be filed with the secretary by November 19, 1904.

For further information address

H. C. BROWN, *Sec'y*,
185 E. State st., Columbus, Ohio.

AKKANSAS BOARD OF DENTAL EXAMINERS.

THE next meeting of the Arkansas State Board of Dental Examiners will be held December 2 and 3, 1904, in Little Rock, Ark., for the examination of all applicants. Those having applied for examination will report to the secretary Friday morning, December 2,

1904, with rubber dam, gold, plastic filling material, and instruments to demonstrate their skill in operative dentistry. Anyone who wishes may bring his own patients. As far as possible, patients will be furnished. The board reserves the right to select the cavity to be filled. The examination will cover all branches of the dental profession. No temporary certificate will be issued to anyone. Examination fee \$5.00. For further information write

A. T. McMILLIN, *Sec'y*,
Fifth and Main sts., Little Rock, Ark.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry will be held at the New City Hotel, Manchester, N. H., December 13, 14, and 15, 1904, for examination of candidates for registration. Candidates should come prepared with all instruments and material to put in both gold and amalgam fillings. So far as possible patients will be furnished by the board.

A. J. SAWYER, *Sec'y*, Manchester, N. H.

ARMY DENTAL CORPS.

CONTRACT Dental Surgeon F. Homer Wolven, from sick in First Reserve Hospital, will proceed to Los Banos, Laguna, for duty. (July 29, D. Luzon.)

The leave granted Examining and Supervising Dental Surgeon John S. Marshall, Presidio of San Francisco, is extended to one month. (Sept. 2, D. Cal.)

Contract Dental Surgeon George L. Mason, will proceed to Fort McPherson, Ga., for duty. (Sept. 21, W. D.)

Contract Dental Surgeon Wm. H. Chambers, from duty in the Department of the Gulf to San Francisco, for transportation to Manila, for duty. (Sept. 21, W. D.)

Contract Dental Surgeon Franklin F. Wing, having reported his arrival at San Francisco, will proceed to Fort Riley. (Sept. 21, W. D.)

Contract Dental Surgeon Edwin P. Tignor, from further duty in the Department of the Missouri, and will proceed to San Francisco, for transportation to Manila, for duty. (Sept. 21, W. D.)

Contract Dental Surgeon Hugh G. Voorhies, from further duty in the Department of the

East, to San Francisco, Cal., for transportation to Manila, for duty. (Sept. 21, W. D.)

Contract Dental Surgeon S. Davis Boak, having reported his arrival at San Francisco, Cal., will proceed to Fort Hancock, N. J., for duty. (Sept. 21, W. D.)

Contract Dental Surgeon Ord M. Sorber, from duty in the Department of Texas to San Francisco, for transportation to Manila, for duty. (Sept. 21, W. D.)

SWEDISH DENTAL SOCIETY.

NOTICE OF PRIZE COMPETITION.

THE Swedish Dental Society announces the opening of a competition for the writing of a popular treatise, to be entitled "The Teeth and Their Care," intended for liberal distribution by the members of the society among persons of those classes in which hygienic care of the mouth is practically unknown. The treatise must be written in the Swedish language, and must not exceed one printed sheet. The competition is open to all members of the dental profession.

Each essay should bear a motto or mark, and should be accompanied by a sealed envelope containing on the outside the same motto or mark, but bearing no indication as to its origin, and within containing the name and address of the author. The essay, preferably

typewritten, should be forwarded, duly signed, not later than February 28, 1905, to the "Jury of the Swedish Dental Society," 19 Drottningatan, Stockholm.

The committee appointed to pass on the merits of the essays that may be submitted will primarily consider whether they fulfill the purpose of a popular treatise on the teeth and their care intended for the instruction of the rising generation in the schools and the information of the lower classes of the people. The essay should embody a plain and easily assimilable statement of the subject, free from dry details and needlessly lengthy descriptions. Original illustrations or reproductions of any already published may be incorporated to facilitate the understanding of the text. Authors should base their statements on strictly scientific facts, excluding hypotheses and doubtful theories.

The awards will be—First prize, 700 kroner (\$185); second prize, 300 kroner (\$80).

The jury appointed by the society consists of the following members: Profs. E. Almqvist and A. Lindström, with Prof. C. Wallis as alternate; also, Drs. V. Bensow, E. Förberg, and G. Forssman, with Dr. G. Modin as alternate.

The prize essays to become the property of the Swedish Dental Society.

On behalf of the Swedish Dental Society,

EMIL CHRISTENSON,
HARALD RAMBERG.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING AUGUST 1904.

August 2.

- No. 766,235, to ARTHUR H. FLEMING. Dental articulator.
No. 766,247, to CHRISTIAN HEILRATH. Tooth-brush.
No. 766,586, to DAVID N. BOOTH. Apparatus for shaping metal parts in dental work.
No. 766,591, to FRANK E. CASE. Dental chair.
No. 766,693, to JAMES A. HALLETT. Dental disk cutter.

August 9.

- No. 766,867, to GEORGE L. BENNETT. Inhaler for anesthetics.

August 16.

- No. 767,469, to ARTHUR W. ZIEGLER and JOHN W. SLATER. Combined tooth-brush and dentifrice holder.
No. 767,705, to ISIDOR LYMAN. Attachment for dental engine.
No. 767,743, to JAMES D. FORD. Dental appliance.
No. 767,744, to JAMES D. FORD. Gold leaf condenser.
No. 767,852, to ZEPH H. TIBBETTS. Dental matrix.

August 30.

- No. 768,697, to MORRIS I. SCHAMBERG. Dental appliance.

THE DENTAL COSMOS.

VOL. XLVI.

NOVEMBER 1904.

No. 11.

ORIGINAL COMMUNICATIONS.

ANATOMIC CHANGES IN THE HEAD, FACE, JAWS, AND TEETH IN THE EVOLUTION OF MAN.

By EUGENE S. TALBOT, M.S., D.D.S., M.D., LL.D., Chicago, Ill.

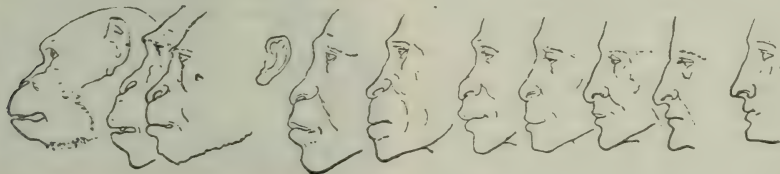
(Read at the first general session—transferred from the Section on Anatomy, Physiology, Histology, and Microscopy—of the Fourth International Dental Congress, at St. Louis, Mo., August 1904.)

[AWARDED "HONORABLE MENTION" BY COMMITTEE ON PRIZE ESSAYS.]

IN his evolution man has undergone many changes. Some structures have been added, others lost. From Thales to Darwin, the attempt was made to discover the laws governing these changes. Empedocles, 495 B.C., outlined from his

Study of this revealed a struggle for existence between organs with interaction consequent on use and disuse of structures. Camper employed this law in his use of the ideal face of the Apollo Belvidere to illustrate the gradual retreat of

FIG. 1.



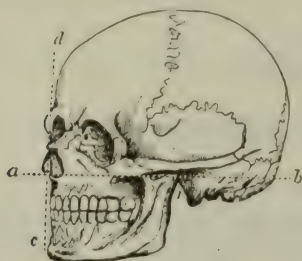
study the doctrine of evolution, involving therein the survival of the fittest. Aristotle, 384 B.C., viewed the relation of the structures and organs to each other from the standpoint of a hypothetic law of economy of growth by which structures were sacrificed as entities to benefit the organism as a whole. Goethe in 1809 and St. Hilaire in 1818 still further cleared this law of obscurity.

the jaws from lower to higher types of face: (Fig. 1.)

The facial angle of Camper, Cuvier, Cloquets, Jacquarts, the Munich-Frankfort angle, and that of Topinard, involves merely the bones of the face, not the inferior maxilla. Most authors dealing with prognathism and orthognathism include, therefore, merely the superior maxilla in the conception. Stomatologic

specialists must include the inferior maxilla in the outline in order to determine what may or may not be required in improving the jaws and teeth. In my studies of the etiology of irregularities of the jaws and teeth I have simply extended the facial line downward below the lower jaw. (Fig 2.) An imagin-

FIG. 2.



ary perpendicular line dropped from the superciliary ridge below the lower jaw decides whether the jaws be prognathous or orthognathous.

The ideal face of Camper is a norm which shows where anatomic progress ceases and pathologic begins. At one stage in the evolution of man the eyes, face, nose, jaws, and teeth were most essential in obtaining food for the nourishment of the body, and equally so in sexual selection. As man developed, owing to brain increase, he acquired the power of obtaining and digesting food with less expenditure of physical strength. Disuse of the jaws and teeth, owing to their becoming less a factor in food-getting, induced atrophy.

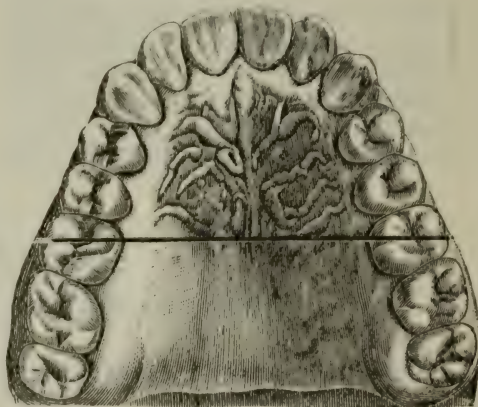
The modern North American negro is an apt illustration. The evolution of the negro in North America has been most wonderful, mentally and physically. In two hundred and fifty years he has developed from primitive conditions to equal in many cases the Caucasian. Typically the negro is long-headed (dolichocephalic), with a face extending beyond the perpendicular line (prognathous). At the present time, nearly fifty per cent. of negroes have faces on the line. Up to this period of facial atrophy the cavities of the nose were large enough for the purpose of breathing, the jaws large

enough for the teeth; the teeth rarely decayed, and interstitial gingivitis (owing to large, well-developed alveolar processes) seldom occurred.

While healthy recession is still progressing under the law of economy of growth, the perpendicular line remains the dividing line between the normal and abnormal.

Associated with antero-posterior arrest is lateral arrest of the face, which as a rule is about as great as the antero-posterior. In such cases protrusion (excessive development) of the nose and upper jaw often occur. The lower is usually arrested. The contraction begins at the upper border of the nasal bones at their junction with the frontal, extending downward to a point midway between the angle of the lower jaw and the symphysis of the chin. Some idea of this lateral contraction is given by Mummery's measurements of ancient British and Roman skulls. These from the outer surface of one first molar to the outer surface of the other (Fig. 3) showed a

FIG. 3.



width average of 2.50 inches. Measurements of Americans revealed an average of 2 to 2.19 inches in normal people, showing a difference in lateral development from those of Mummery of about 0.30 of an inch. The effect is to produce a narrow (hatchet) face.

In order of developmental atrophy of the face, the dividing line between the normal and abnormal in jaws and teeth

would occur when the jaws from outside of the first molars measure from 2 to 2.20 inches and the antero-posterior atrophy brings the face on or inside the perpendicular line. In a general way these two points are the lines of demarkation between normal and abnormal. Structures which degenerate for the benefit of the organism as a whole are transitory structures. At these two points, owing to arrests of development, the stigmata of degeneracy are most marked. At these points the normal ceases and the pathologic begins.

Conditions which modify healthy degeneracy or normal atavism are ordinary and socially consanguineous marriages, intermixture of races, climate, soil, food, etc. These, however, do not produce such marked arrests and excessive development as are caused by an unstable nervous system in the parent as well as in the child.

Even folk-lore, the science of primitive man, accepts direct relation of deformities in the child to the parent. Its taboos and charms are often attempts to regulate these.

With that stage of development of the religious sense marked by assigning malign occult powers to natural objects and forces, this view of degeneracy became systematized, and exposed weakly or deformed offspring, charged to evil powers, to death. This occult conception of degeneracy is even yet a part of American folk-lore. Against degenerate children charms are still used by the "witch-doctors" among the Pennsylvania Dutch, who are on the level of culture of the early seventeenth century middle English, if not a little below it. The folk-lore of these, as embodied in Shakespeare, demonstrates, according to J. G. Kiernan,* that ere the seventeenth century the fact that "mental and moral defect expressed itself in physical stigmata was recognized and even the term used." "It is an old prejudice," Thistleton Dyer remarks, "not yet extinct, that those who are defective or deformed are marked by Nature as prone to mischief."

In "A Midsummer Night's Dream" (v. 1) Oberon* wards off degeneracy from the issue of happy lovers by the charm—

"And the blots of Nature's hand
Shall not in their issue stand:
Never mole, hare-lip, or scar,
Nor mark prodigious, such as are
Despised in nativity,
Shall not upon their children be."

"So many several ways are we plagued and published for our father's defaults," remarks old Burton,† "in so much that as Fernelius truly saith, 'It is the greatest part of our felicity to be well born, and it were happy for human kind if only such parents as are sound of body and mind should be suffered to marry.' An husbandman will sow none but the best and choicest seed upon his land; he will not rear a bull or horse except he be right shapen in all parts, or permit him to cover a cow or mare except he be well assured of his breed; we make choice of the best rams for our sheep, rear the neatest kine, and keep the best dogs. And how careful, then, should we be in begetting of our children. In former times some countries have been so chary in this behalf, so stern, that if a child were crooked or deformed in body or mind they made him away; so did the Indians of old, by the relation of Curtius, and many other well-governed commonwealths, according to the discipline of those times. 'Henceforth in Scotland,' saith Hect Boëthius, 'if any were visited with the falling sickness, madness, gout, leprosy, or any such dangerous disease which was likely to be propagated from the father to the son, he was instantly gelded; a woman kept from all company of men; and if by chance having some such disease she were found to be with child, she with her brood were buried alive'; and this was done for the common good, lest the whole nation should be injured or corrupted. A severe doom, you will say, and ought not to be used among Christians; yet more to be looked into than it is. For

* "Folk-lore of Shakespeare."

† "Anatomy of Melancholy," sixth edition, 1652, part 1.

* *Alienist and Neurologist*, 1895.

now, by our too much facility in this kind, in giving way for all to marry that will, too much liberty and indulgence in tolerating all sorts, there is a vast confusion of hereditary diseases, no family secure, almost no man free from some grievous infirmity or other, when no choice is had, but still the eldest must marry, as so many stallions of the race; or if rich, be they fools or dizzards, lame or maimed, unable, intemperate, dissolute, exhaust through riot, as he said, they must be wise and able by inheritance. It comes to pass that our generation is corrupt, we have many weak persons both in body and mind, many feral diseases raging among us, crazed families; our fathers bad, and we are like to be worse."

The unstable nervous system of the parent which produces arrests and excessive development in the child is often due to excesses involving toxic agents. These are divisible into those belonging to the condiments, medicines, foods, and beverages, those arising from occupation, and the auto-toxemias. Tobacco, alcohol, opium, tea, coffee, and cocain, as well as lead, mercury, and brass, produce toxic effects. Excesses in a social way, late hours, etc., may produce profound systemic nervous exhaustion with auto-toxemia in the ancestor and especially the ancestress, likely to be transmitted as degeneracy to the descendant.

The acute and chronic contagious and infectious diseases in the parent, especially the mother, necessarily exert the same toxic influences upon the fetus, impoverishing it, and checking healthy nutrition.

The factors producing degeneration in the child are due to a nervous exhaustion in the first generation, which implies a practical degeneration in function, since tone is lost.

Every nerve cell has two functions, one connected with sensation and the other with growth. If the cell be tired by excessive work along the line of sensation or motion, the function as regards growth becomes later impaired, and it not only ceases to continue in strength but becomes self-poisoned. Each of the organs (heart, liver, kidneys, etc.) has its own

system of nerves (the sympathetic ganglia) which, while under control by the spinal cord and brain, act independently. If these nerves become tired the organ fails to perform its function, the general system becomes both poisoned and ill-fed, and nervous exhaustion results. In most cases, however, the brain and spinal cord are first exhausted. The nerves of the organs are thus allowed too free play, and exhaust themselves later. This systemic exhaustion has local expression in the testicles in the male, in the womb and ovaries in the female. Through this the body is imperfectly supplied with natural tonics (antitoxins) formed by its structures, and the general nervous exhaustion becomes still more complete. All the organs of the body are weakened in their function. Practically, the neurasthenic in regard to his organs has taken on a degenerative function, albeit not degenerating in structure, since the restlessness of the organs is a return to the undue expenditure of force which occurs in the lower animals in proportion as it is unchecked by a central nervous system. Through the influence of various exhausting agencies, the spinal cord and the brain lose the gains of evolution, and the neurasthenic is no longer adjusted to environment.

Since the reproductive organs suffer particularly, children born after the acquirement of nervous exhaustion, more or less checked in development as the influence of atavism is healthy or not, repeat degenerations in the structure of their organs which in the parent were represented by neurasthenic disorders in function. As the ovaries of neurasthenic women are markedly affected by the nervous exhaustion, the offspring of these do not retain enough vigor to pass through the normal process of development.

On embryonic development, maternal environment exercises an enormous influence in the direction of arrested or progressive development. Maternal shock produces arrests of development which are not photographic conditions, but survivals of embryonic states. While maternal impressions do have an effect, it is simply in conditions of arrest and not in

photographic reproductions of the alleged cause of the impression.

In intra-uterine life, periods of stress occur around which, as Kiernan remarks, the disappearing and developing tendency of organs necessarily centers. At these periods certain functions and structures are to be lost by the disappearing and others gained by the developing organs; maternal shock checks proper progress at these periods.

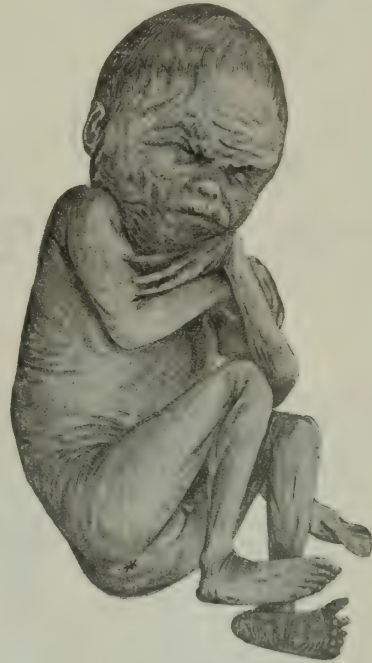
When systemic balance, the result of evolution, is disturbed by change in environment, the organs, as has been shown experimentally by Jacques Loeb,* do not pursue their usual growth. Such disturbances are peculiarly apt to occur during periods of stress because of the then varying relations of different organs.

Struggles for existence on the part of the different organs and systems of the body are hence most ardent during the periods of intra- and extra-uterine evolution and involution. During the first dentition, during the second dentition (often as late as the thirteenth year), during puberty and adolescence (fourteen to twenty-five), during the climacteric (forty to sixty), when uterine involution occurs in woman and prostatic involution in man, and finally during senility (sixty and upward), mental and physical defect may, as I have elsewhere shown,† be evinced in a congenital tendency which has remained latent until the period of stress.

The first period of stress is the most important so far as the head, face, jaws, and teeth are concerned. It is called the senile or simian period (Fig. 4), and occurs at four and one-half months of fetal life. The influence of neurasthenia in the parent may result in a bony arrest of development shown to occur in animals by Charrin and Gley, and in man by Coolidge. The facial bones, jaws, and teeth are peculiarly liable to be thus affected. Though the effect of disease on the parent be but temporary, the child's development may be checked as to higher tendencies.

The factors entering into the struggle for existence most markedly involve the relations of the brain to the head and face. During intra-uterine life the face loses and the brain gains. During the first extra-uterine period of stress, between birth and three months, the brain is one-fifth the weight of the body, while in the adult it is but one-thirty-third. During the first six months the brain

FIG. 4.



doubles in weight. The effect of stress during this period would, under the law of economy of growth, either be felt in diminution of the quality or quantity of the brain or in the preservation of these at the expense of more transitory structures like the face, nose, jaws, and teeth. This is well illustrated in the contrasted skulls here shown (Fig. 5). After birth the face gains at the expense of the brain. The body and face, as a whole, so gain on the growth of the brain that, as Havelock Ellis* remarks, further growth from the third year onward, though an absolutely necessary adaptation to environ-

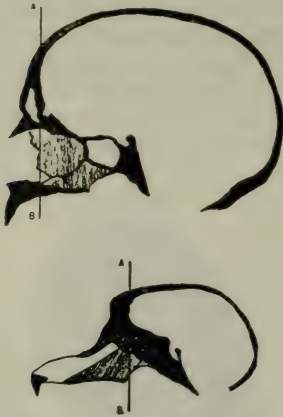
*"Untersuch. zur Physiol. Morphologie."

†"Degeneracy, its Signs, Causes, and Results."

*"Man and Woman."

ment, is to some extent growth in degeneration and senility. The loss of child

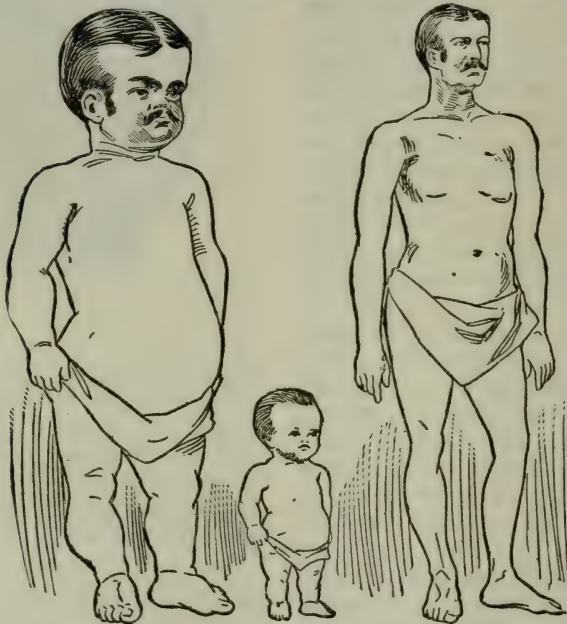
FIG. 5.



potentialities is well shown in Fig. 6, where the perfectly developed being

uterine evolution and involution. At the periods of sex-differentiation, and at the simian or senile period (Fig. 5), irregular balance given the struggle for existence leads to imperfect sex-differentiation or premature senility. This last often produces irregular and incomplete ossification. Since, as Harriet Alexander* has shown, degeneracy is a process of evolution leading to alteration of form because of cessation of inhibition in certain directions resultant on diminished work, it logically follows that since diminished function precedes change of structure, increased function checks the change of structure in its bichemic stage. Nay, more, structural elaboration due to gains from degeneracy may be retained while degenerate structures resume their higher functions. Hence a degenerate race may rank higher in evolution because of the beneficial variations due to degeneracy.

FIG. 6.



fulfilling the promise of the child is contrasted with the man that the child actually becomes. Struggles for existence on the part of the different organs and systems of the body are most ardent during the periods of intra- and extra-

The structures of the face, as Minot has shown in man, are degenerate as viewed from the vertebrate type. They are structures which quite early in evolu-

* *Medicine*, 1896.

tion have been sacrificed to the gains of the central nervous system. (Fig. 6.) On them, therefore, do struggles for existence between organs leave decided

from photographs of patients, accurately portray arrests of the face for the benefit of the brain. The gradual recession of the face and the forward development of

FIG. 7.



marks. The jaws and face are less marked in type with rise in evolution.

The reverse phase of evolution, with which Camper did not deal, is that of which the present paper treats. This phase of evolution underlies all pathology

the brain is a gradual continuation of Fig. 1 in the line of evolution. From the relations of this face-degeneration nearly all diseases of the nose, jaws, alveolar processes, and teeth result. In many cases reverse evolution progresses still farther,

FIG. 8.



FIG. 9.



of the face, as well as of the nose, jaws, alveolar process, and teeth. The illustrations, supplementing those of Camper, portray this reverse phase, where symmetry of the body as a whole is sacrificed to changes in the nose, jaws, alveolar processes, and teeth, so as to preserve brain gains.

The next illustration (Fig. 7), taken

till, owing to an unbalanced nervous system and movements of the lower jaw, atavism results. Illustrations 8 and 9, in Fig. 7, exhibit a greater exaggeration of the lower jaw—a return to the anthropoid and lower negro type.

Two facial types result from arrest of development. Fig. 8 shows the arrest antero-posteriorly, while Fig. 9 shows

lateral arrest. All other forms of arrest are modifications of these two. They may become either more intense or less marked.

Through phases of the evolution of man affected by an unstable nervous sys-

tem, either in parent or child or both, arrests and excesses in development (degeneracies) may occur in the face, eyes, nose, jaws, alveolar processes, and teeth, and form the foundation of all pathology of these structures.

A TRANSMISSIBLE SYSTEM OF PORCELAIN INLAY.

By ARTHUR E. PECK, D.D.S., Minneapolis, Minn.

(Read before the Massachusetts Dental Society, at its annual meeting, Boston, June 1, 1904.)

THIS paper was written for the purpose of showing a transmissible system of porcelain inlay, the details of which are made so clear that those desiring to become proficient in this branch of dentistry can do so with every assurance of success. To formulate a system which would admit of this required the adoption of those mechanical principles which insure uniform results, thus eliminating much of the personal equation, which makes it possible for all to produce perfect restoration with porcelain.

Success in this branch of dentistry necessitates careful attention to detail and a thorough comprehension of cavity preparation. The strength, retention, perfect margins, and color of the inlay are all largely dependent on this step of the operation. A restoration which will be subjected to the stress of mastication requires a cavity so shaped that the inlay will be self-retaining from every direction in which pressure is liable to be directed; it should also give to the filling the full strength of the material used, leaving to the cement the simple duty of eliminating the moisture, and of retaining the inlay in its position. To avoid acute angles (which are a menace to perfect margins) the walls of the cavity should be perpendicular to the surface of the tooth. An imperfect angle of the wall will give a variable refractive surface of the cement, which will destroy

what might otherwise have been perfect harmony in color. A cavity whose depth will admit of only a veneer of porcelain would have its color entirely changed by the reflection of the cement. These few reasons are given to show why cavity preparation must be considered the foundation to a successful inlay. Yet there are many today who are making inlays with a preparation they would not accept for cement, and to this apparent neglect of the underlying principle I attribute the main reasons for the little advance made in porcelain inlay during the past six or seven years.

The clinics, as a rule, do not teach us as much as they should; few are able to see every step of the work, and to miss one point, in many operations, means failure. Nearly all things look easy when others are doing them, especially if they are well done; and this phase of the question has placed it where many of the profession have come to think that a few have been blessed with exceptional skill. Therefore I think the sessions of our societies would be more beneficial to many if they were given in the form of a post-graduate course, having any number of specialists the society wished, and under each branch taken up have a list of the instruments required, making it largely of a technical nature. The members could then choose the subject which they wished to consider, and come prepared to do work which

would give to them the technique of the operation.

THE WRITER'S SYSTEM.

However, it is not my intention to map out a course for this or any other society to follow; my views on this subject are given, not with the intention of criticising, but to illustrate why I wish to place this system before you in this manner. Direct application to details will give in the minimum time a thorough knowledge of this class of work, and as it is constructed largely on mechanical laws, positive results can be obtained. A blow from an assistant will give as close a fitting matrix as one from an expert. If the matrix is reinforced before it is removed from the cement die, there is little danger of its form being changed; if we bake in a mold the results are the same, no matter who does the baking. Mechanical laws are transmissible, but the results that depend on the deftness or skill of some expert are not easily given to others.

The ability to teach others with this system enables the operator to place much of this work on an assistant. To illustrate this point, I will cite the case of a young lady who had never served in the capacity of a dental assistant, who in less than six weeks was able to take the impression from the operator, reinforce and invest it in the die-cup, grind up the porcelain, and bake the inlay, relieving the operator of practically all the work out of the mouth.

The rest of this paper will bear directly on the details of this system, beginning with cavity preparation, which will be illustrated by these models; then we will consider the material used and the color problem, the taking of the impression, matrix formation, and a method for building anterior contour and occlusal fillings. The figures shown are intended to illustrate only the typical cases, showing the principles involved.

Cavity preparation has been divided into eight classes, as follows:

1. Cavities involving one surface—labial cavities.

2. Cavities involving more than one surface—mesio-labial.

3. Cavities involving mesio-labial-lingual surfaces.

4. Cavities involving mesio-labial-lingual-incisal surfaces.

5. Cavities involving labial-lingual-incisal surfaces.

6. Cavities involving the whole incisal edge.

7. Cavities involving the approximal and occlusal surfaces of the posterior teeth.

8. Cavities involving the whole occlusal surface of the posterior teeth.

The three initial steps in the preparation of cavities for this work are the same in this as in all others; first, breaking down of undermined enamel; second, removal of the softened dentin; third, extension for prevention. But the fourth, extension for retention, is a distinctive feature of this system, the theory of which must be fully comprehended before applying it to practical cases.

PREPARATION OF CAVITIES.

The preparation for the first class, which involves only the labial surface of the tooth, differs only from the usual preparation in that the walls of the cavity must be perpendicular to the respective surfaces which they intersect. This preparation will give a body of porcelain

FIG. 1.



FIG. 2.



without acute angles, which are always a menace to the strength and permanence of the filling. (Fig. 1.)

The preparation for the second class of cavities, which involves the approximal surfaces but not the lingual, is shown by this model; if retention be desired, it can be obtained by means of a groove in the bottom of the cavity. It will be noticed that the incisal and gingival borders of the cavity are at right angles to

the approximal surface. This insures the square body of porcelain which is so essential to the life of the inlay. (Fig. 2.)

Cavities of the third class (Fig. 3) involving the labial, approximal, and lingual surfaces, are the first to show exten-

FIG. 3.



FIG. 4.



sion for retention, which must continue well in to the firm tooth-substance. A groove in the floor of the cavity, assisted by the walls being slightly V-shaped from the lingual to the labial surface, will give sufficient retention from all lingual and lateral pressure. This class of cavities can approach the incisal edge much closer than would be safe in preparing for a gold filling, as many times the enamel rods are weakened by the force required to place the gold in position. But if these rods are left intact, and an inlay that exactly fits is cemented in, they have nearly, if not absolutely, the same support they had before the ravages of decay set in.

Cavities of the fourth class, involving the labial, approximal, lingual, and incisal surfaces, are the most difficult to restore and require good judgment, skill, and patience.

Fig. 4 represents a typical preparation for this class. The formation is such that most of the retention is secured by means of grooves. A cavity prepared on this principle will not require a separation of the teeth to remove the impression or to insert the filling. The typical way of shaping this class of cavities may be made to vary to suit particular conditions, but the principle of retention remains the same.

Cavities of the fifth class involve the labial, lingual, and incisal surfaces, and are illustrated by this model. While at first glance the cavity (Fig. 5) seems to show a V shape, it will be noticed that a short distance back from the incisal edge the walls are perpendicular to the incisal surface. A slight groove down the sides

and across the base of the cavity will give it sufficient retention, or a variation can be made, as these models will illustrate.

Under the sixth class we have a cavity involving the whole incisal edge, which is illustrated by Fig. 6. The preparation is self-explanatory, it being made mostly by means of a stone slightly grooving the center of the cavity (mesio-distally), and bringing the margins of the labial and lingual surfaces to a sharp edge. On either side of the pulp, a slight depression is made with a round bur to mark the place for the pins to be inserted.

FIG. 5.



FIG. 6.



This will be transferred to the impression, and in turn to the matrix, giving a correct guide for placing the pins.

Fig 7 will illustrate cavities of the seventh class, involving the approximal and occlusal surfaces of the posterior teeth. To insure perpendicular walls of porcelain, this preparation must be cut well out to the buccal and lingual surfaces.

Owing to the tendency of porcelain to contract on itself, this cavity is so shaped

FIG. 7.



FIG. 8.



that, for retention, pins are used instead of grooves. A slight depression is made with a round bur at the point of the cavity where the pins are to be placed. This will be transferred to the impression, and in turn to the matrix. After the matrix is invested, it is then perforated at the point indicated by the depressions, and the pins are inserted into the investment,

allowing the points to project a sufficient distance to support the inlay.

Cavities of the eighth class, involving the occlusal surfaces of the posterior teeth, open a field well worth all the time and expense required to become proficient in porcelain work. To be able to restore with porcelain the contour, color, and surface of teeth that have been worn off by abrasion (so much as to require the bite to be opened) is certainly a step forward in dentistry.

Fig. 8 gives a view of the preparation showing the grooves and depressions marking the site of the pins. It will be readily understood that the principle of retention for this system is grooves and pins. The grooves should be made so that the impression will draw, and be in a position to resist the stress of mastication.

FORM OF PORCELAIN USED.

Porcelain which has been baked and re-pulverized is in a more permanent form than when it was in the original powder. The first fusing burns out some of the coloring matter, and then, when it is re-pulverized to a finer degree than the original baking, it will be found to fuse at a much lower temperature, thus insuring the original color. I should like to impress on you the importance of this method of obtaining color, as I believe it to be the only sure way of reproducing the exact shade without a pyrometer.

While pyrometers are certainly efficient, and essential with other powders, they are entirely unnecessary with this method of obtaining the right color. A few degrees difference in the temperature of the first baking will change the shade, but preparing the powder by re-pulverizing it (according to above directions) leaves little, if any, danger of this change. This rule applies as perfectly with the low-fusing bodies as with the high.

COLOR PROBLEM.

This is usually considered the most difficult part of the porcelain question. If a suitable transparent cement could be obtained, we would then have only to

match the tooth, which would be a comparatively easy task; but at present we must deal with the cements which are at our disposal, and to overcome the reflection from this opaque substance taxes our skill and ingenuity to the utmost. The first step to be considered in overcoming this difficulty brings us again to the importance of a proper cavity formation. One which was only deep enough to admit of a veneer for an inlay would reflect a shade from the cement, and thus destroy what may have been a perfect match before it was cemented to place. The cavity should be made as deep as possible. Porcelain being a non-conductor, thermal changes will not affect the pulp, and the thicker the inlay the less the shadow reflection.

A wall of the cavity not perpendicular to the surface of the tooth will give an inlay whose shadow reflection from the cement will be greater at the margins than at the center. The cement used for inserting the filling is an important factor, as the shadow from it is sure to darken the inlay; therefore we must make our inlays a shade lighter than the tooth. The writer has followed the rule of using a white cement for all inlays, believing it to give the minimum shadow effect, and one soon learns how much lighter to make the inlay to offset this shadow. A change in the color of the cement gives an entirely different result, and should be well considered before adopting. The most difficult class in which to obtain perfect harmony in color is that which involves the labial surface near the incisal edge. This is due usually to inability to excavate deeply at this point, and the flat surface shows the shadow from the cement at nearly all angles. This can be partially obviated by placing the cement on the walls only, and Canada balsam at the bottom of the cavity. If these few points are followed closely they will assist materially in the solution of the shadow problem.

TAKING THE IMPRESSION.

It is not necessary to use the rubber dam in taking the impression. After the

cavity is thoroughly desiccated, protect it from moisture by having the patient hold a piece of cottonoid between the teeth; then mix the cement until it will admit of handling; at this stage incorporate soapstone until all of the adhesiveness is destroyed. Now force it into the cavity, holding it to place with a strip of aluminum, being sure to have equal pressure on all parts of the cement, as it is apt at this consistence to crowd out at the point of least resistance. After removing, it is reinforced with cement, as it would not be strong enough to withstand the stress to which it will be subjected.

When the reinforcing cement is hard, the impression is trimmed down to admit of the formation of a matrix. This should be invested in modeling compound in the

die-cup. The platinum is then partially formed to this impression and placed in the die-cup receptacle; a piece of moldine is pressed on top of the platinum, and the plunger driven firmly down upon it. This will give a matrix that conforms perfectly to every part of the impression. The folds are now burnished out and the matrix removed.

The edges are clipped about one-quarter of an inch apart; it is then annealed, replaced on the die, and swaged again; the edges of the matrix are now turned up so they will be incorporated in the investment material, which is then poured upon it. When the investment is hard, invert the die-cup and tap the side, allowing the investment and matrix to drop into the hand. It is now ready for the baking.

IMMEDIATE ROOT-FILLING.

By N. A. DE WITT, D.M.D., Cambridge, Mass.

(Read before the Massachusetts Dental Society, at its annual meeting, Boston, June 1, 1904.)

THE subject which has been allotted to me at this time is one which will not admit of any display of literary talent, in which you will find me somewhat lacking, but upon which a few solid facts and experiences gleaned from three years' constant use of the materials, and the successful treatment of nearly sixteen hundred cases, may be some benefit to you.

There are very few of us who would not hesitate for a minute to use a root-canal filling and immediately seal the apical foramen of a root, if we were sure that the patient would have no further trouble. Most of us have held to the old practice of H_2O_2 and chloro-percha treatment, simply because it might be easily removed from the root in case of trouble, and also because of the advantage claimed by many, of the easy removal of the cotton dressing in case trouble arises.

My first experience with the treatment which I now use was with roots which I intended to prepare for crown or bridge work, and where it was nearly impossible, and often quite so, to seal up a dressing in the canal. It was then that I realized, more than ever before, the necessity of some sort of treatment whereby a root could be thoroughly cleansed and filled immediately. I confess that it was with a little hesitation that I began on these lines, but the results I obtained were so gratifying that it was but a very short time before I was giving every such tooth similar treatment.

When a patient returns after having had a tooth with a putrescent canal treated, the first question we all ask is, "Well, how has the tooth felt since you were here last?" and, no matter what the treatment has been, the answer comes back to us often, "Well, the tooth has felt

fairly well with the exception of a little soreness the next day, but it is all right now." That same answer came back to me when I was using the H_2O_2 and the dressing of eucalyptus, or some other antiseptic oil, and filling with chloro-percha at a subsequent sitting; it also came back at times after the treatment I am now using, but I am glad to say that the reports are more favorable, and we have the advantage of gaining considerable time, and having the root in condition to proceed with the rest of the work.

The treatment, as I use it, is divided into two distinct parts. In the case of a tooth with a putrescent canal, my treatment consists in first thoroughly cleansing the canal, or canals, with sodium and potassium. This is a preparation put up by Dr. J. E. Ward, coming in six small glass tubes, and any practitioner can successfully use it by following directions.

The material has a great affinity for moisture, and should be used with care around the patient's mouth, and, wherever possible, the rubber dam should be employed. The few minute particles of the sodium and potassium which will cling to the barbs of the broach are sufficient to work into the canal at one time. This should be repeated again and again until a sudsy appearance is noticed, when it should be carefully washed out with water and removed with a broach. You should always exercise the greatest care, and not force any débris through the apical foramen, as this is what "raises the rumpus." The action of the sodium and potassium on the decomposed matter in the root-canal turns all the fatty materials into soap, which is easily washed out with water, and entirely removed with the assistance of a broach. Then, instead of having a dirty looking root-canal—as it appeared at first—after this cleansing out it is as clean as though it had been scrubbed with a brush.

The next thing to do is to thoroughly dry out the root-canal, which I always do with a saturated solution of hydronaphthol and alcohol. This part of the operation takes probably about ten or fifteen minutes, and we are then ready to fill the canal or canals permanently.

The preparation I use for this purpose is a cement, and is something I have compounded myself, and with which I am thoroughly satisfied. It is something which you can all prepare yourselves, and is composed of the following materials. I use the oxychlorid powder and liquid. To the oxychlorid liquid I add about twenty-five per cent. formaldehyd; this completes the preparation of the liquid part of the canal-filling. The powder is composed of fifty per cent. of oxychlorid cement powder, and the other fifty per cent. is made up of hydronaphthol, iodoform, alum, tannin, and thymol. Each of these has its special purpose in different cases of treatment which we have, and all combined make a permanently antiseptic filling. It is claimed for hydronaphthol that it is a harmless, odorless disinfectant and preservative, possessing one-fifth the antiseptic strength of mercury bichlorid, double that of iodoform, and fourteen times that of carbolic acid.

Iodoform has been used for years in the treatment of foul canals, and once in a while now-a-days we run across a tooth that was filled with it and cotton some twelve or fifteen years previous, and that has given scarcely any, or no trouble.

Thymol and alum are the principal constituents of many of the mummifying pastes on the market, and the tannin and alum have a hemostatic action.

The formaldehyd, hydronaphthol, and iodoform come in for their share of the work in the treatment of foul canals. When we have just removed a live pulp, with a chance of particles of the pulp still remaining in the canal, there is nothing so nice as to be sure you have something in the form of thymol and alum to mummify these small particles, and a hemostatic like alum or tannin to check any blood-flow.

This root-filling should be mixed the same as we ordinarily mix the oxychlorid cement for the same purpose; simply mix it stiff enough so that it can be picked up with a smooth broach and pumped up into the canal. When mixed in this way it sets very slowly, giving ample time to do the work properly.

After I have filled the root with the cement, I select a gutta-percha canal point of proper size, and insert it into the canal as far as possible. This will press out all surplus cement, and will also avoid the formation of air bubbles; then I take a hot instrument and cut off the point as close to the canal as possible. I now take a small pledget of cotton in my pliers, and press the whole root-filling up solid until the patient begins to complain. Sometimes the patient will complain of a little pain for the first minute or two which is probably due to the irritating effect of the formaldehyd coming in contact with the tissues beyond the end of the root, but this feeling passes away very quickly, and is no reason for fearing unsatisfactory results. A root-

filling of this material can be removed, I believe, if ever necessary, just as easily as one of chloro-percha. There is no shrinkage of the material after it has been inserted into the canal, and after it has been in the tooth for a day or two, any amount of force can be applied against it without the liability of pressing it through the apical foramen—a thing which cannot always be done when materials of less consistence have been used.

I have now used this preparation in my office practice for over three years, and while I have had some few failures—that is, where I have had to remove the root-filling for a second treatment of the root—I am positive it is far superior to the old way of treating teeth.

THE FUNDAMENTAL PRINCIPLE OF ORTHODONTIA.

By NORMAN G. REOCH, D.M.D., Boston, Mass.

(Read before the Massachusetts Dental Society, at its annual meeting, Boston, June 1, 1904.)

EACH science is governed by its own fundamental principles, and the application of science in the arts and manufactures is also regulated by well-known scientific laws. The discovery and application of these laws have contributed largely to the inventions and improvements which characterize the age in which we live.

As common sense is the basis of all law, and as the common chord in music is the basis of all harmony, so common occlusion is the basis of the science of orthodontia, and to a large extent of all other branches of dentistry as well.

In the study of cases of malocclusion, before we can hope to achieve anything of real worth in corrective procedure, it is essential that we have a thorough understanding of what normal occlusion is, and all that the term implies. To understand this in a broad, comprehensive manner the orthodontist must be conver-

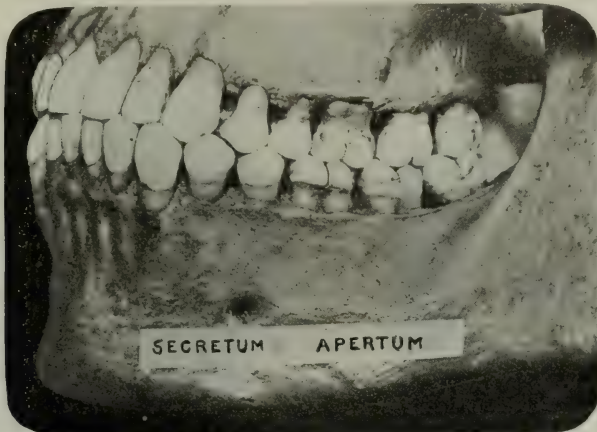
sant with the minute anatomy of the teeth, their inclined planes, cusps, inclinations of crowns and roots (of the deciduous as well as of the permanent teeth), the growth and development of the maxilla and mandible with their alveoli; the periodontal membrane; the development and eruption of the teeth; the attachments and functions of the various muscles—tongue, lips, cheeks—and the part they play; the more he knows of rhinology the better; last, but by no means least, he must have a knowledge of facial art. When he appreciates the beautiful normal relationship of the teeth of the mandible with those of the maxilla, how each individual tooth is dependent, not only upon its fellows mesially and distally, but upon the opposing teeth and all the teeth collectively to maintain it in harmony; and inversely, how the whole mechanism of mastication is dependent upon each individual tooth to maintain

its perfect harmony; when he has a comprehensive understanding of all this, then and only then should he turn to look at any of the various types or deviations from the normal. The necessity for this preparatory study cannot be too strongly emphasized.

The importance of occlusion, it seems to me, cannot be overestimated. And I

generally considered, it is only necessary to recall how many patients come under our observation with frightfully mutilated mouths and facial expressions that have been brought about by extraction of teeth—to prevent some developing form of malocclusion usually. Who is to blame—the dentist extracting the teeth? or are we all to be held accountable for

FIG. 1.



Normal occlusion. (From collection of Dr. E. H. Angle.)

fear the significance of this fact is not so thoroughly impressed upon the mind of the student as the case demands. The fault is perhaps largely due to the textbooks. Little or no space is devoted to a study of the parts when normal; but this most valuable step in the study of orthodontia is, with perhaps one or two exceptions, skimmed over superficially or not touched upon at all, in the scrambling haste to get at the all-absorbing topics of appliances and treatment.

From my experience, I believe that the part occlusion plays in maintaining malposed teeth in malocclusion on the one hand, or in holding the teeth in their correct relations on the other, is not yet appreciated by the general practitioner to the extent that it ought to be. It is safe to affirm that this subject will, in the near future, receive the consideration which its importance merits. For proof of the statement that occlusion is not

the paucity of writing upon the subject, and the perverse instruction often received? But the man who knows occlusion, and recognizes its intimate connection and bearing upon the facial lines, as well as upon mastication, will not extract a tooth for regulating purposes, unless indeed under the most exceptional circumstances; and when he does, it will be only after the most painstaking study and consideration of the facial requirements.

Fig. 1 shows the teeth in their normal relationship, all the inclined planes in perfect harmony. By the Angle school the first molars are taken as the key to occlusion. The Angle classification of irregularities is based upon the relation of these teeth. Normally, as here shown, the mesio-buccal cusp of the upper first molar occludes, or is received, into the buccal groove of the lower first molar. As Dr. Bogue says, "The upper molars

ride astride the buccal cusps of the lower molars." The teeth distal to the first molars come in contact with their antagonists in a similar manner. The upper first premolar is received between the premolars below, its mesial incline occluding with the distal incline of the buccal cusp of the lower first premolar. The mesial incline of the upper canine occludes with the distal incline of the lower canine, etc. It is to be noted that

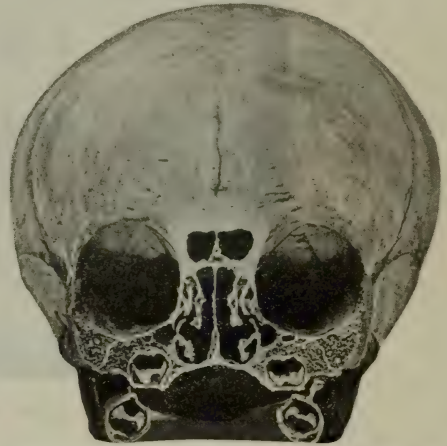
occupy by far the greater portion of the maxillary bones at this period. It is but natural that any interference with the processes of development will have dire results upon the permanent teeth. The teeth always erupt along the line of least resistance. Usually the least resistance is in the immediate wake of the temporary teeth. Dr. Cryer says that there are two processes associated with inflammatory conditions within the jaws—one

FIG. 2.



Skull of child of six years. (From collection of Dr. E. H. Angle.)

FIG. 3.



Vertical section through embryo skull. (From collection of Dr. M. H. Cryer.)

each tooth of each arch is opposed to two antagonists, with the exception of the lower centrals and upper third molars. By this arrangement the grinding surface is increased immensely. The teeth of man are degraded in form and in specialization as compared with the teeth of the carnivorous and herbivorous types. But they are beautiful examples of the process of evolution, and are nicely adapted to the food they are called upon to masticate. But this increased grinding surface is only one of the means to an end. Another great function of this inter-digitation or "cog-wheel" effect, is the mutual support afforded each tooth in all directions.

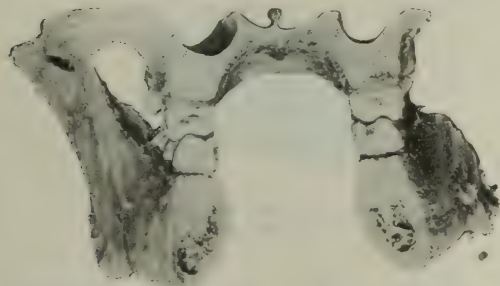
Fig. 2 shows the skull of a child of six or seven years, the deciduous teeth in position with the developing permanent teeth in their crypts. The dental organs

suppurative and destructive, the other constructive, a building up and hardening process. If during this delicate period of the eruption of the permanent teeth, any inflammation sets up within the jaws, hardening of the bony capsule containing the developing permanent tooth may take place. It is thus prevented from appearing. It may remain impacted for years, or for the rest of the individual's natural life. Or again, it may be pushed along the line of least resistance and erupt at a point considerably removed from its normal position. Too long retention of deciduous teeth that have become diseased will set up a local inflammation. This sometimes stimulates the bone-building cells to renewed activity, with the result that new, ivory-like bone is formed about the permanent tooth in its crypt, and it is prevented from appearing

on schedule time. These are some of the causes of malformation in the jaws and malocclusion of the teeth.

In Fig. 2 the first permanent molars have just erupted, and are being guided down to their correct relations. The teeth of the deciduous set are almost always in normal occlusion. It follows that this tooth, the first of the permanent teeth to appear, is usually directed to its normal position within the arch and to a normal relationship with its fel-

FIG. 4.



(From Dr. Cryer's collection.)

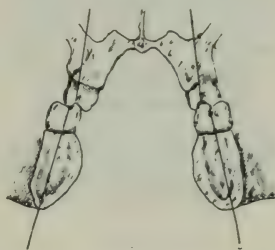
low in the opposing jaw. Thus you will see the logic in Dr. Angle's basing his classification upon the relative position of these teeth. It devolves upon this molar to withstand the stress of mastication, and to uphold the jaws during the shedding of the deciduous teeth. Because of its vast importance it is built well and large, and should be guarded zealously. If for any reason it drifts from its normal relations, the malocclusion should be corrected at once, to adjust the inclined planes, maintain the balance of force, and thus make all the conditions favorable for the incoming permanent teeth.

Notice that the developing molars in the lower jaw are high up in the ramus. The upper third molar germ must be in close proximity to the floor of the orbit. The wedging process, due to the growth and development of the teeth, can be studied well in this picture. Each erupting molar is carried forward in a curved direction as the next tooth posterior forces its way to place.

The lower jaw is generally conceded to be the mold over which the upper is formed. This is usually the case as regards the eruption of the teeth, for the lower always slightly precede the upper corresponding teeth.

Fig. 3 is from Dr. Cryer's collection. He says, "It is plainly to be seen that the width of the upper jaw is much less than that of the lower." Lines passing vertically through the tooth-germs will readily prove this. And this relation exists

FIG. 5.



Drawing showing forces at work to modify form of arches.

throughout life. The alveolar process of the upper jaw develops down and out, while that in the lower extends up and in; so when normally developed the upper teeth describe a larger circle than the lower. In other words, the upper molars and premolars "ride astride" the buccal cusps of the lower teeth.

It will be seen in this picture (Fig. 4), also from Dr. Cryer's collection, how all the forces of mastication, or the normal reaction of the mandible upon the maxilla, tend toward the maintenance of broad, shapely arches. But if this normal reaction of one jaw upon the other be interrupted, this very force becomes a powerful factor to influence the molding of the arches abnormally. Extraction is one of the evils always followed by more or less inharmony. Mouth-breathing is another factor preventing normal occlusion, for it is a physical impossibility for the mouth-breather to keep the teeth occluded. Consequently, the arches are modified in form. Dr. Cryer has pointed out the fact that though the muscles of

the cheeks do exert a certain influence in molding the arches abnormally, this lack of occlusion in the mouth-breather is the principal cause.

Another great province of the inclined planes is the important part they play in directing the erupting teeth to their proper positions in the arch. If the incoming teeth get outside this normal influence of the inclined planes, they (the inclined planes) then become factors in

This picture (Fig. 6) shows a common type of malocclusion, a developing case. The lower right lateral incisor has erupted in lingual occlusion. The lip pressure has forced the other incisors lingually until the space is practically closed. The lower arch is therefore diminished in size by just the width of that lateral incisor, and the inclined planes are forced to exert their influence abnormally. The upper arch is obliged to

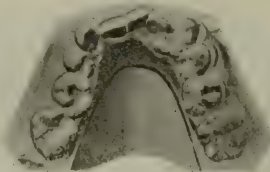
FIG. 6.



H— case.

the production of various types of malocclusion. There is often a time during the replacement of the temporary teeth by their successors when harmony and in-harmony are in the balance. It is the office of the orthodontist to so direct the erupting teeth that they will come under the correct influence of the inclined planes.

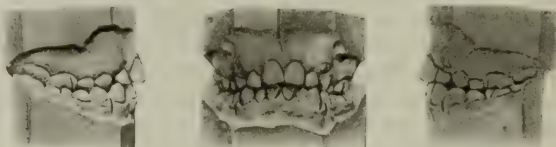
FIG. 7.

Occlusal aspect of lower arch in
H— case.

conform itself to the lower. The pressure of lips and cheeks does this, until the case reaches the condition shown in the figure. With the appearance of the canines the malocclusion will be even more marked.

I show this picture (Fig. 7) of the occlusal aspect of the lower arch simply that you may the better see how the arch

FIG. 8.



Case of Henry P—.

Fig. 5 is a drawing showing a cross section through the molar region to show the conditions we often meet with. The upper arch is contracted in size from loss of teeth by extraction, and it shows how the action and reaction of the mandible operating through the abnormal occlusion tends toward the further contraction of the upper arch.

is being molded by the lip pressure, because of the loss of the wedging process, due to the malposition of one of the stones of the arch. It is utterly hopeless for such a case to "correct itself" without interference.

In Fig. 8 we see another form of developing malocclusion. The same points may be traced out here as in the previous

slide. The lower laterals are in lingual occlusion, with consequent diminution in the size of the arch. The upper arch, in its endeavor to establish the best occlusion it can, has effected this by the lingual movement of the upper incisors, so that the spaces necessary for the incoming canines are obliterated. These teeth, in consequence, are coming down in labial occlusion, but in reality they occupy about their normal positions. The whole trouble here is in the diminutive sizes of the arches, due again to the loss of the wedging process. Still, this case does not call for the harsh treatment of the extracting forceps. The procedure indicated is the expansion of upper and lower arches and making the space necessary for the canines. In other words, "Treatment in all cases of malocclusion is simply the placing in harmony of the inclined planes." (Dr. Angle.)

These two last cases illustrate pretty well types that might well come under that antiquated class, where the jaws are too small for the teeth. However, the jaws proper in each case I believe to be perfectly normal in development. The arches are small; but that smallness is entirely confined to the arches and their alveoli. It seems to me that it is time that that old, fossilized theory of "small jaws and large teeth" be exploded. Of course, we will occasionally come in contact with a case where there is undoubted

lack of development associated with other malformations in other regions due to nutritional causes. But I have seen and read of so many cases that apparently would exactly fit this theory of the inheritance of "small jaws of one and large teeth of the other parent" which when treated by the conservative method round out into ideal results, with facial lines that are very harmonious, that I am convinced such cases are so rare as to be hardly worth considering. We must always bear in mind that a child's mouth must be a little full, or prominent. This is because the crowns of the teeth have obtained their full size, but the jaws themselves are not fully developed and ossified for a number of years after the permanent teeth are in position.

Now, ladies and gentlemen, I have tried to give you some thoughts upon this great fundamental principle of occlusion. They are not new or original thoughts, by any means. So I hope your criticism of this paper will not be like that of the old Scotch minister, who, asked his opinion of a paper read by a young clergyman, said that there was something new and something true in what they had just heard, but the trouble was that what was *new* was not *true*, and what was *true* wasn't *new*. I hope that what I have advanced, if not new is at least true, and that you may have derived some benefit from it.

A PLEA FOR THE LONG CUSP IN DENTAL PROSTHESIS.

By Dr. STEWART J. SPENCE, Chattanooga, Tenn.

BEFORE the advent of Bonwill's articulating frame the dentist had just cause to shun the long-cusped porcelain tooth, knowing its tendency to dislodge the plate when occlusion would be made in any but the one position permitted by the old-style articulator. Though perhaps awake to the better masticatory power of the long and sharp cusp, the

dentist sacrificed the benefits to be derived therefrom in order to conserve stability of the plate. With the advent of the Bonwill system of articulation the necessity for this precaution ceased to exist.

In nature the cusp is usually long,—long, that is, as compared with that of the average porcelain tooth. Nature's

law seems to be that the buccal cusp of the first upper bicuspid shall be as long proportionately to the cusp of the canine as this is to the lateral incisor, measuring this last from its incipient cusp.

As the canine is essentially a carnivorous tooth, it would seem that its neighbors the bicuspid were also intended by nature for eating flesh rather than vegetables—that is, for tearing rather than for crushing; and their forms and manner of occlusion show that they are specially adapted for stretching and tearing food. Especially to the flesh-eater, therefore, is injustice done by depriving his porcelain denture of the cusps of the bicuspid. It does not, however, follow that the vegetarian is bettered by this practice, for nature's bicuspid is also a better crushing apparatus than are the flat-topped pegs to which porcelain bicuspid are often reduced by the grindstone.

To help us appreciate these facts let us study the forms of these teeth, their occlusions, and the motions of the mandible. We will take up especially the bicuspid.

RELATION OF THE FORMS OF BICUSPIDS TO MASTICATION.

In the act of mastication the first motion is a descent of the lower jaw, and simultaneously an excursion by it outward on one side and very slightly forward. No mastication of food is done in this motion. The food is then pushed by the tongue between the thus separated teeth, and then the mandible performs its incursion by first closing somewhat vertically upon the mass of food, and then proceeding inward in a more horizontal direction. As the food becomes softened by mastication the excursion becomes less extended outward, and the closures become more nearly straight up and down. While the lower jaw is making the incursion in this somewhat horizontal direction, the bicuspid perform the first part of their act of mastication by stretching and tearing the food—as the buccal cusps of the lower bicuspid pass inward through the spaces between the

buccal cusps of the upper bicuspid and the canine, stretching and tearing the food in their passage. This being done, a second and somewhat similar act immediately follows. The said lower bicuspid cusp falls into a basin formed in the occlusal surface of the two upper bicuspid by their four surrounding cusps and by two eminences—extensions of these cusps—which stretch across the occlusal surfaces of these teeth from cusp to cusp. (They virtually stretch across, though usually separated by a narrow valley near the center.) As the lower cusp falls into this basin the food is further stretched over these two eminences and the four cusps which tower up at their extremities, and thus once more the food is rent. Besides the stretching thus applied as the cusp falls into this basin, there is a simultaneous grinding and crushing action, as of a close-fitting pestle entering a mortar; and thus these teeth exhibit a double device for stretching and tearing food, with a mortar-and-pestle attachment for grinding it. To cut away the cusps entirely is to ruin this splendid device, and even to cut away these occlusal eminences while sparing the cusps, is to sacrifice their contribution to the stretching and tearing action, as well as to largely lessen the crushing capacity by converting the mortar into a trough, which latter is a shape less fitted for crushing when used in connection with a cusp or pestle.

It is obvious that the longer the cusps, and the deeper the intercusp space and the occlusal basin, the more will the food be stretched and torn in mastication.

When we contemplate the splendid, divinely-originated device of nature for masticating food exhibited in the human bicuspid, and then contrast it with the flat-topped pegs so often turned out by the ruthless grindstone, our souls rise up in protest against such desecration of nature's sublime ideals.

SHAPE OF BICUSPIDS AS AFFECTING STABILITY OF ARTIFICIAL DENTURES.

But while none can question the superior masticatory ability of the naturally-shaped bicuspid, the question arises,

Is it permissible in dental prosthesis?—will it not tend to instability of the plate?

Even those of us who agree theoretically that it is correct to follow nature's leadings, and who have adopted Bonwill's system, seem to be timid in venturing out nature's whole distance, if one may judge from several articles which have appeared in the journals during the past few years. For instance, Dr. Geo. B. Snow expressed himself afraid of the "long underbite," deeming it a menace to stability of plate. Another writer advocated the grinding out of the occlusal groove so as to reduce it to a trough. Now, while all must respect the genius of Dr. Snow, I am tempted to question his position in this particular, and I decidedly object to the obliteration of the occlusal eminences. While admitting that a plate with long cusps is more apt to be displaced while making the incursion, especially if nearly horizontally, I deem it evident that the superior masticatory power of teeth with long cusps and deep occlusal basins is so great that it is better the patient should be supplied with these even if he be thereby forced to abandon some, or even all, of his natural lateral bite and resort to the vertical closure only.

And this is so because, as is self-evident, the long cusp and deep basin must be very efficient in tearing and crushing food, *even if only the vertical closure be made*. It is equally self-evident that the lateral closure, when made with cusplless teeth, must be but little more effective in mastication than when the vertical closure is made with similar teeth, because there is nothing in the flat tooth in the way of a raised portion to arrest and hold to place the food, and it tends to slide with the laterally-moving tooth. Patients complain that the food slips out from between such teeth. And with those very difficult cases, where the lower ridge is gone, which do not admit of any lateral motion at all, not even with flat teeth, it is obviously better to give the patient a denture which can, even with only the vertical bite, to some degree stretch and tear his food, as well

as crush it, than to give him one which can only crush it, and which does even that less efficiently than does the other.

The only other ways in which dislodgment of a plate by mastication can occur are two. First, a bite on one side of the mouth may tilt the plate loose on the other side, or if the bite be made by the incisors the loosening may occur at the posterior border. Second, a cusp, or a tilted tooth—such as a lower second or third molar which has moved forward—may strike in closing against the side of another cusp or any inclined surface, so as thereby to shove the plate out of its place.

I think it can be shown that the first of these two forms of displacement is less liable to occur with long-cusped than with cusplless or short-cusped dentures, and that the second cannot occur at all if Bonwill's mode of articulation be followed. With regard to the first: With long cusps, when, say, the lower *right* bicuspid is at that part of the incursion when its buccal cusp is passing between the two buccal cusps of the upper bicuspid, then—if the case is correctly set up—the palatal cusp of the upper *left* second bicuspid will come in contact with the mesio-buccal cusp of the lower first molar, and this contact will prevent the loosening of the plate on the left side, although biting may be going on at the right side. At least the tendency to displacement is much less. This is so because the contact of these two left cusps takes place while the jaws are not yet fully closed, but are still held apart the length of one of these cusps, which separation allows a space on the right side for the food in a yet not hard-pressed condition.

But if these cusps are ground away, it is evident that before the plate can obtain the support to be had from contact of the teeth on the left side, the occlusal surfaces of the teeth on the right side, where the food is, must come into actual contact with each other, which they cannot do until they have bitten entirely through the food, the which, especially if it be tough and not easily penetrated by blunt surfaces, would tend to

dislodgment of the plate by loosening it on the other side. For this reason, therefore, even if it had no use in mastication, this palatal cusp of the upper bicuspids ought not to be removed.

With regard to the other above-mentioned means of dislodgment of the plate: This shoving aside by a point striking an inclined surface cannot occur if teeth are set up on the Bonwill articulator with proper regard to their four normal occlusions. These four are: the protruded mandible, when both condyles move forward until the incisors meet tip to tip; the two lateral bites, when one condyle remains in its socket and the other moves forward, to right and left respectively; complete occlusion, when both condyles are in their sockets and the jaws closed. The only other possible occlusions are those made when the mandible is protruded farther than is needed for the tip-to-tip occlusion of the incisors, and then, when thus protruded it is also moved laterally to right or left; but as these posi-

tions are never assumed in eating they are not factors in the problem of plate-displacement.

From these considerations it appears evident that—except, perhaps, for the very aged—the long-cusped denture, because of its greater efficiency in mastication, is to be preferred to the cusplless one, because its points can be so arranged as not to interfere with other points in the various normal closures of the jaws, but, on the contrary, to so come in contact as to tend to preserve the stability of the plate, and because if either cusps or lateral movement have to be abandoned, it seems better to sacrifice the latter.

In bridge work there is not even the small excuse for uncusping the teeth that there is in plate work, because in bridge work they are firmly retained in place. And yet it is a fact that large and costly bridges are often inserted without any regard to their efficiency as masticatory organs, judged from the Bonwill standpoint.

CORRESPONDENCE.

THE DIES IN THE SWAGING OF PLATES.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir.—Allow me to call attention to Dr. John H. Meyer's remarks (page 592 of the July issue of the DENTAL COSMOS) on the matter of dies, in his reply to my paper. He says that in gold work he makes three sets of dies, and in platinum two sets, and uses pure lead for the counter-die.

It must be a material that batters easily which requires so many dies. My claim is that Babbitt metal does not batter, except in thin ridges, so I find but one die necessary.

Pure lead is too soft for the counter-die. Unless care be used there is danger

of spreading the plate, and thus causing a misfit.

I claim that a plate swaged on a proper Babbitt-metal die will fit the model snugly, and if the model be a correct representation of the jaw, the plate will be found to fit the latter. So I have worked along this line all these years exclusively in artificial dentures, with success.

No doubt Dr. Meyer makes a success with his method, but why burden the young man with all this needless labor?

Yours truly,

L. P. HASKELL.

CHICAGO, ILL.

PROCEEDINGS OF SOCIETIES.

FOURTH INTERNATIONAL DENTAL CONGRESS, ST. LOUIS, MO.,
August 29 to September 3, 1904.

Opening Session—Monday, August 29, 1904.

(Continued from page 853.)

DR. A. W. HARLAN, New York, called upon by the President to introduce the foreign delegates to the congress, made a few appropriate remarks in presenting Dr. OTTO ZSIGMONDY, Vienna, the official representative of Austria, who spoke as follows:

Mr. President, ladies and gentlemen: I thank you from the bottom of my heart for this very kind and enthusiastic reception. In Austria, as in other countries, a remarkable change has taken place, in the sense that dentistry is now fully recognized by the government as being of the utmost importance to public hygiene. As a proof of the increasing interest our authorities are taking in dental matters, I should state that, not content to gather information about international dental congresses from the official reports, they deemed it fit to appoint an official delegate to this congress. The desire often expressed by the Austrian dental societies may now be considered almost realized.

I wish to be permitted to mention another improvement which is likewise the result of our efforts. Special dental courses have been organized for army surgeons in which they can obtain not only the special training desirable, but at the same time they attend gratuitously to the teeth of the soldiers of the Vienna garrison.

To these statements I have only to add my sincerest thanks for the privilege of having been permitted to address to you these words, and to express a confident

hope that the results of this great and memorable congress will bear further good fruit for my country also. (Applause.)

DR. RUDOLPH WEISER of Vienna, Austria, delegate from the Central Union of Austrian Stomatologists and the Association of Dentists of Prague, was next introduced, and spoke as follows:

Mr. President, ladies and gentlemen: If the wonderland America is in general a voyage-aim for the cultivated classes of society, a dental congress in the United States will exert upon us as professionals an attractive power to a most exceptional extent.

The Americans have always been ahead in converting theoretical results into practical applications of benefit to mankind. Consequently, and by natural logic, they ought to distinguish themselves in dentistry, and indeed they may be considered pioneers in this branch of knowledge.

I should now like to inform you that we Austrians have a still greater incentive to study your institutions thoroughly and to enter into friendly personal contact with you because the universities in our country are just about to place education in this branch of surgery upon a new and sound basis.

I have the honor to express to you, in the name of the Central Union of Austrian Stomatologists and of the Association of Czech Dentists of Prague, the most cordial thanks for your kind in-

vation and warm reception. As the delegate of the aforementioned dental associations I feel happy to transmit you the sincerest wish that the results of your enterprise may be of real benefit to the nations of the world. (Applause.)

Dr. Harlan next introduced Dr. ALFRED BURNE, the representative of Australia, who spoke as follows:

Mr. President, ladies and gentlemen: I trust I shall be pardoned this morning if I take for my cue a line from the ghost in Hamlet, "Brief let me be." I feel that there are so many to follow me that I do not desire to take your time. From the state of Victoria, New South Wales, I desire to extend to the congress congratulations and good wishes for a very successful meeting. I feel that we who have come such long distances to this congress are like the wise men who followed the star of Bethlehem. We are looking to the Fourth International Dental Congress, seeking the light that we need, and which I think we shall find. Gentlemen, I thank you. (Applause.)

Dr. J. M. MAGEE, St. Johns, N. B., Canada, was next introduced and spoke as follows:

Mr. President, ladies and gentlemen: I came here simply as a dentist, and it was with the greatest distress that I learned I would be called upon to speak for the great country to the north. I am very sorry that I cannot respond on behalf of the profession in Canada as befits the occasion, but the representative who could worthily represent it is unfortunately absent, and I was unexpectedly called upon to take his place. I am very proud to be honored on this occasion by being permitted to speak to you, and, as my predecessor from the antipodes expressed it, I thank you. (Applause.)

Dr. E. SAUVEZ, Paris, was next introduced, and addressed the meeting as follows:

Mr. President, ladies and gentlemen: In the name of the government of the French Republic, of which I have been commissioned delegate together with my eminent *confrère* and friend Dr. Godon,

I have the honor of saluting the aurora of the Fourth International Dental Congress.

I will also present you the good wishes for the success of this meeting on behalf of the Directeur de l'Assistance Publique of Paris, who has delegated us for the purpose; and finally, as president of the French committee on publicity and propaganda and of the national federation of France, I want to offer you the assurances of our sentiments of confraternity and sincere admiration for the constant efforts which American dentists have been making for so many years for the purpose of elevating the status of our profession.

The École Dentaire, Paris, which represents the most important institution for dental education and the most vital one in our country, takes the greatest interest in your work, in your journals, in your schools, because you have traveled toward the ideal with gigantic strides. Sixty-five years ago the first dental school in the world was created in Baltimore. Today about sixty-five schools are being operated upon United States territory. It must be clear to everyone that a country capable of creating on an average a school per year must necessarily be that in which the status of the profession is the highest.

We are particularly happy to bring to you our token of admiration in this beautiful city of St. Louis, the heart of the United States, where so many names remind us of France, the first one to give to the modern centuries, through the cession of Louisiana, the example of a colony voluntarily ceded by the parent country, and when we look at the prosperity of your beautiful country, and at the splendor and importance of your Exposition, we cannot refrain from thinking of the just statements made by Livingston, the ambassador of the United States, at the time of the signing of the Louisiana Purchase. He prophesied the future in such a precise way that you have not hesitated to inscribe part of it upon the monument commemorating the event.

Dr. W. D. MILLER, Berlin, the repre-

representative from Germany, was greeted with loud applause.

Dr. HARLAN. It is not necessary, it seems, that I should introduce Professor Miller, our distinguished representative from Germany and the guardian of American dentistry in Europe.

Dr. MILLER. *Mr. President, ladies and gentlemen:* I do not need to say that I thank you very heartily for this courteous show of friendship on your part, and that I reciprocate it most fully. I come to you as the representative of the National Dental Association of Germany, of the National Association of Dental Societies, and of the National Association of Dental Faculties of Germany. These three bodies embrace, I may say, practically all the prominent dentists of the country, and they have asked me to convey to you an expression of cordial goodwill and sympathy. They wish me to assure you also of their great appreciation of the grand work done in America by the dental profession, and of their hope and confidence that this meeting will, like all other dental meetings held on American soil, contribute much to the advancement of our profession. (Applause.)

Dr. HARLAN. I have pleasure in introducing to you the representative of the government of Holland, Dr. John E. Grevers, Amsterdam, who was a member of the International Medical Congress held in Washington in 1887, and of the World's Columbian Dental Congress of 1893 in Chicago.

Dr. JOHN E. GREVERS. *Mr. President, ladies and gentlemen:* I thank you very heartily for your kind reception, and I thank you for the opportunity you have given me of coming before you as the representative of a very small country—a country, however, which is full of loving interest for everything pertaining to dentistry. My gracious little queen, Wilhelmina, has kindly delegated me to represent her government at this congress; and this act marks the beginning of a great period for Holland, as the government is becoming more and more interested in mat-

ters relating to dentistry, which in our country has for many years been regulated by law, but not to its best interests, I am sorry to say. I think I can now prophesy that the present ministry will do much toward bettering the conditions for those desiring to enter upon the study of our specialty.

I have also come to bring you greetings from two dental societies, the Odontological Society of Holland and the Union Society of Dentists. Both have delegated me to represent them, and to bring to you their heartfelt greetings, and the hope that the outcome of this congress will be most beneficial to dental science throughout the world. Again I thank you for your very kind reception. (Applause.)

Dr. VINCENZO GUERINI, Naples, the representative of Italy, was introduced by Dr. Harlan, and spoke as follows:

Mr. President, ladies and gentlemen: As the representative of the Odontological Society of Italy and of the Neapolitan Medical Association, I have the honor of bringing to you a fraternal greeting from the Italian dentists.

A strong current of sympathy, originating from great historical events that are known to all of us, unites and will ever unite Italy to America. Every new manifestation of progress, every fresh success of yours, has our sincere applause, and my colleagues in Italy hope that this great dental congress may add a new glory to the many accomplishments which your nation can already boast.

It is the source of great happiness to me to find myself for the first time in the United States, in this great center from which the light of civilization and of progress radiates so abundantly over the whole world; and this day, when I have the honor of standing in the midst of so eminent an assemblage of talent, constituted for the most part of the elect of the dental profession in America, will ever be one of my dearest remembrances.

In conclusion, gentlemen and ladies, I will express my fervent desire that the brilliant results of this great international congress may constitute a new and

solemn affirmation of the autonomy of dental science, which Americans have the merit of being the first to recognize, and which is the indispensable condition of rapid progress in dentistry.

May this congress strengthen still more the bond that unites all the dentists of the world into one body, rendering it more easy for the dental profession to achieve fresh triumphs in the field of scientific and practical dentistry for the welfare of humanity. (Applause.)

Dr. JOSÉ J. ROJO, Mexico City, Mexico. *Mr. President, ladies and gentlemen:* I thank you for your kind reception. It is with great pleasure that I have the honor of addressing you as delegate from the National Mexican Dental College and from the Mexican Dental Society. Permit me to express our feelings of appreciation and special sympathy with the organizers of and co-operators in this great historical event, the Fourth International Dental Congress. Besides this, in the name of the dental profession of the Republic of Mexico, I want to express our best wishes for a successful meeting, and many beneficent results to our profession. (Applause.)

Dr. JAIME D. LOSADA, Madrid, one of the representatives from Spain, spoke as follows:

Mr. President, ladies and gentlemen: I feel a deep sense of emotion on this occasion, as it is for me a great honor and pleasure to address you in the name of Spain. My government takes the greatest interest in all matters relating to dental science, and as a further proof of this interest has sent beside myself, as governmental delegates, two of the greatest dental men we have in Spain, Drs. Florestan Aguilar and Dr. Luis Subirana, and it is through their courtesy and also in their names that I address you.

I have to thank you most heartily for the kind way in which we have been welcomed by the city of St. Louis, and by the Fourth International Dental Congress. We are full of admiration for your magnificent Exhibition, one of the greatest wonders the world has ever seen. This

sentiment of admiration is still greater to us, coming as we do from countries which have existed almost since the pre-historic periods, as we realize that your wonderful land has accomplished in a few years—thanks to the progressive genius of the American people—that for which other countries have consumed centuries.

I am happy to say that dentistry is one of the up-to-date sciences in Spain. Our teaching of this branch compares very favorably with that of any other country, and our requirements are very high. My *confrères* in Spain are most progressive, and, of course, as in every part of the world, American systems are in vogue. Many of the young dentists from my country, knowing that America is the true spring of modern dental science and the mother of dental education, come to your land, regardless of sacrifices, with the object of improving their knowledge, and then return to the mother country usually with the American D.D.S. appended to their names.

Again I thank you for your cordial welcome, and my only regret is that I am not familiar enough with your language to be able to express well enough the sentiments of admiration and friendship from my professional brethren in Spain. (Applause.)

Dr. L. C. BRYAN, Basle, the representative of Switzerland, spoke as follows:

Mr. President, ladies and gentlemen: Considering the late hour, the small spot which I represent on the map of the world, and the large number of speakers to be heard from, I will only extend to you the cordial greetings of the profession of Switzerland, and say that it is our great desire that the next dental congress may be held in our hospitable country, the playground of the world. I thank you very much. (Applause.)

Dr. HARLAN. Among those who have been appointed as official delegates to this congress you have standing before you Dr. J. Y. Crawford of Nashville, Tennessee, delegate of the United States Government. (Applause.)

Dr. J. Y. CRAWFORD. *Mr. Presi-*

dent, dental diplomats of the world, ladies and gentlemen: In all the experiences of my life I have never felt more profoundly my responsibility than in the duty which I am now trying to perform. I extend to you, the representatives of the nations of the earth, on behalf of the Government of the United States, our greetings, and welcome you most heartily on this auspicious occasion. The people of America, and particularly the departments of our government, whether it be the executive, legislative, or judicial, are in sympathy with the idea of gathering together at stated intervals congresses representing the various interests of the world, and we come with our congratulations, most earnestly invoking such interest and solicitude in the discussions of odontological questions at this time as will bring great benefits to the world, and result not only in the improvement of the masticating apparatus of the human family, but tend to relieve suffering humanity and add to the comfort of the population of the world. We are created upon the fundamental principle of equal rights to all and special privileges to none; we therefore enter most heartily into the business of this congress for the improvement and betterment of the condition of mankind. By the authority of the great government located at Washington, resting upon the will of the people of this great nation, we extend our most hearty congratulations. Mr. President, as the humble representative of the Government of the United States, I pledge you to do all that we can for the advancement of the interests of this congress and the profession of dentistry the world over. (Applause.)

Dr. EDWIN P. TIGNOR, representative of the Army Dental Corps, was next introduced, and spoke as follows:

Mr. President, ladies and gentlemen: It gives me great pleasure to be able to be present at this great meeting. It was a great surprise to me, and a very agreeable one, to receive the order directing me to proceed here in order to represent the Army Dental Corps, and I thank you very

much for the privilege of being allowed to speak to you today.

Dr. Harlan next introduced Dr. J. M. WHITNEY, Honolulu, the representative of the Hawaiian Islands, who spoke as follows:

Mr. President, ladies and gentlemen: As I was sitting greatly enjoying the proceedings, my friend Dr. Kirk touched me on the shoulder and said, "We must hear from the baby of our republic," to which I replied, "No, you had better excuse me," but Dr. Harlan says no excuses are acceptable here. I am here not as representing the baby country, because we had an organization in Hawaii long before California was known to most of us. I was privileged to stand before you at the Second International Dental Congress, at that time as a foreigner, but now I am proud to stand before you as one of you. You are one with us and we are one with you, and I thank you for this honor. (Applause.)

Dr. HARLAN. It affords me particular pleasure, ladies and gentlemen, to be able now to present to you my old associate and collaborator in the preparation of the proceedings of the World's Columbian Dental Congress of 1893, Dr. Louis OTTOFY, the representative of the Philippine Islands. (Applause.)

Dr. OTTOFY. *Mr. President, ladies and gentlemen:* It is with the greatest pleasure that I join my distinguished predecessors upon this floor in expressing to you my sincere thanks for your most cordial welcome. I assure you that I highly appreciate the opportunity and privilege of being present to witness the erection of another milestone in the history of the progress of dentistry, a progress which may not inaptly be likened unto the progress of our great nation—a nation which during the last few years has extended her civilizing hand across the seas to a people emerging from the darkness of semi-ignorance into the bright rays of intelligence. Some idea of this influence may be formed when I mention the fact that, while I come from a territory over which wave the stars and

stripes, I have traveled a greater distance to come here, excepting one gentleman from Java, I believe, than any other member of this congress.

While here with you, it shall be my sacred duty to learn all I possibly can of the advance made by our profession, and to carry back the fruits of your thought and labor to the Philippines. On behalf of the dental profession of the Philippine Islands, which I have the honor to represent, I again thank you heartily for your cordial welcome. (Applause.)

Dr. SALVADOR PRATTO was introduced by Dr. Harlan, and spoke as follows:

Ladies and gentlemen: As delegate of the Odontological Society of Uruguay I desire to express to you our most cordial sentiments of confraternity and esteem.

You no doubt know that there is a little country in the southern extremity of this hemisphere, a small country in area, but large in brains and activity, and its organization in educational lines places it at the head of the South American intellectual movement. In my country, as in all other South American republics, we carefully follow the progress achieved by dentistry in this country, without any delay save that implied by the distance which separates the two countries.

I feel a deep sense of gratification, realizing that I shall be the medium of conveying to the Odontological Society of Uruguay an account of your deliberations and a description of your operative ability and of your discoveries in the field of practical dentistry.

I am a sincere admirer of the genius of America's sons, whom I regard as the first to establish permanently the separate profession of dentistry upon an autonomous basis—thus cultivating the fruits of a plant which germinated in France, and which is now being diffused throughout the universe for the welfare of suffering humanity.

I wish to express my earnest desire for the success of this gathering, and I furthermore wish to say that I feel proud and happy to be a member of the foreign delegation.

Dr. HARLAN. In every country with a population of five hundred thousand or over will be found installed somewhere a representative of America practicing dentistry. I have pleasure in presenting to you Dr. J. W. NOBLE of Hong Kong, China.

Dr. NOBLE. *Ladies and gentlemen:* It gives me great pleasure to appear before you this morning, and to have the opportunity to thank you for the cordial reception you have given to the members from foreign countries—with whom I feel I am included this morning—as well as to myself. I regret very much that all those practicing dentistry in my part of the world cannot be with me here today to see the progress taking place in our profession in science and art. They are missing that which we are gaining, and we can only sympathize with those who are absent from us during the present week. (Applause.)

Dr. BENJAMIN VIDAURRE, representative from Nicaragua, was next introduced, and spoke as follows:

Mr. President, ladies and gentlemen: The Government of Nicaragua, whose duly accredited representative I am proud to be, sends greetings to the Fourth International Dental Congress. Please accept from my profession and myself sincere thanks in the name of my country for the courtesies that have been extended to me. I am glad to say that my government has always shown not only a desire, but an eagerness, to assist in any scientific work or lend aid in any way that will further the ends of progress. Our president, on being invited, did not hesitate to send a representative of the government to the congress, and while that representative may not shed much light upon the deliberations of this body, he will endeavor to take back with him part at least of the great treasures which will emanate from this congress. Again I thank you most heartily for the cordial reception tendered me. (Applause.)

Dr. JOAQUIN YELA, Jr., official delegate of the Government and Dental Faculty of the Republic of Guatemala, Cen-

tral America, was presented, and spoke as follows:

Mr. Chairman, fellow delegates, ladies and gentlemen: If I were to speak now in my own native tongue, very few of you, I am sure, would understand me—although, from my speaking in my broken English the number of sufferers may be greater; relying, therefore, on your own well-known patience and goodness, I will try to make myself understood in the beautiful language of Shakespeare and Longfellow.

For many reasons I could have wished that it had fallen to the lot of a delegate of greater distinction and experience than myself to respond to your very kind invitation to speak, but I do recognize that in letting your choice fall upon me you have acted, not out of regard to the special delegate, but out of compliment to the country whose government and dental faculty I have the honor, however unworthy, to represent at this congress—a country which is linked to the United States of America by so many ties both of a commercial nature and of sincere friendship.

I observe with great pleasure that there are to be discussions and conferences on many and very important dental topics which it will be for us to report to our respective governments and faculties.

It only remains for me now, Mr. Chairman and fellow delegates, to express once more my very cordial thankfulness for the benevolent reception accorded me here, and to express as well the same sentiment of thankfulness to the people of this beautiful city of St. Louis, assuring you all that I am the interpreter of the feelings of the government, faculty, and people whom I have the honor of representing in this highly distinguished assembly. (Applause.)

Dr. RAGNWALD HENDRICKSEN, Christiania, the representative from Norway, was presented, and spoke as follows:

Mr. President, and members of the Fourth International Dental Congress: On behalf of the dental profession of Norway and the Christiania Dental Society, it is with the greatest pleasure that

I greet you. Norway is the farthest northern country represented here, and although cool of climate we are warm of heart, and our profession as a whole and individually are profound admirers of American dental science. We all try to follow your methods and are eager to know more and more, and therefore have sent and are sending to your colleges many students.

The cordial, friendly spirit which you have shown to all of us foreigners will always be a delightful remembrance, and I wish to express the most sincere thanks both from myself and my Norwegian brethren.

The official representative of the Norwegian Government, Mr. Anderson, has not arrived, and I could not refrain from expressing a few words on behalf of my nation. (Applause.)

Dr. N. S. JENKINS of Dresden, Germany, was presented to the congress, and spoke as follows:

Mr. President, ladies and gentlemen: With all my heart I wish to bring to you the greetings of the body of colleagues practicing their profession under the American degree in the empire of Germany. They send to you their most cordial and fraternal greetings, and beg you to believe that they are heart and soul with you in every effort toward uplifting and carrying forward the ever-increasing influence of the great profession to which we all belong. (Applause.)

PRESIDENT'S ADDRESS.

The PRESIDENT. *Ladies and gentlemen, members of the Fourth International Dental Congress:* The next order of business is the address by the President of the Fourth International Dental Congress, and as an evidence that I never really intended to preside over this body, until the election had been finally ratified on this floor, I am here today at this wedding feast without a wedding gown—namely, the "President's address." My remarks, therefore, shall be brief.

At the threshold of this great gathering of the profession from all parts of

the world, I bring you the greeting of the Hon. Theodore Roosevelt, President of the United States, for a most pleasant, profitable, and successful congress. I desire also to acknowledge the courtesy and interest of his Excellency the Governor of Missouri.

To the official delegates representing foreign governments, and the representatives of dental societies in other countries, assembled here today, I extend a most cordial and hearty greeting, and beg to express the hope that their stay among us may be most agreeable and pleasant. It is a matter of sincere congratulation to welcome this splendid representation from abroad, and to be able on behalf of the profession in America to felicitate them upon their achievements in the advancement of professional interests in the various countries from which they are accredited.

We in America are pleased to note the great interest which our brethren from abroad evince in the congress, not only by their presence, but more particularly by their contributions to the excellent program which has been prepared for this meeting. We welcome them with open hearts, and cordially reciprocate the warm sentiments which they have ever expressed to representatives of the profession from America on occasions like the present.

It is indeed a pleasure to commend the enterprise, enthusiasm, and liberality displayed by state and local societies and colleges in America, in their very generous contributions to assist in defraying the necessary expenditures in preparing for this congress.

The Organization Committee also desires to acknowledge at this time their indebtedness to the Hon. Howard J. Rogers, director of congresses, for the ready and willing support which he has at all times rendered, and for his unflinching interest and solicitude in everything having for its object the complete success of the congress.

To the members of the profession in America assembled here today I bring the greeting of the authorities of the Louisiana Purchase Exposition, and that of

the officers and committees in charge of the preparations for this great meeting. In point of numbers this is the largest dental congress ever held, which must be a source of great satisfaction to all our people. The program, from a literary and a scientific standpoint, has never been equaled. No such array of talent has ever before been brought together, and I am sure that the results achieved at this meeting will make an epoch in dentistry that will for many years be referred to as one of the most brilliant in the annals of the profession.

Many questions will come up for discussion, the correct solution of which will require earnest and thoughtful deliberation, and I urge upon you the necessity of cultivating a broad and liberal spirit in the consideration of the great problems with which you are confronted.

This is not the time nor the place to burden you with references to matters of history, or to treat in an academic way the great questions of the hour.

You are conversant with the early history of dentistry, the lack of sympathy and support by the medical profession, the great obstacles to proper professional recognition; the difficulties encountered by the early practitioners; the wonderful achievements with crude facilities for practice, and withal the splendid and brilliant results obtained by the great men who have shed undying luster upon the profession which they honored and served so well. The past is secure; so let us approach the duties of the hour with the same spirit of self-sacrifice and love for the profession that animated the fathers of dentistry.

I trust that every member of the congress will do his utmost to promote harmonious action throughout the various committees and sections, so that all shall work together for the complete success of the congress and the glory of dentistry. (Applause.)

The PRESIDENT. We are signally honored by having with us today the president of the International Dental Federation, a distinguished gentleman who is well known to all of you for his sterling

qualities, and for the great ability he has shown not only as a practitioner of dentistry, but as an executive officer, and I now have the honor of presenting to you our distinguished *confrère* from France, Dr. CHARLES GODON of Paris, who will address you. (Applause.)

Dr. GODON. *Mr. President, ladies and gentlemen:* At this, the first meeting of the Fourth International Dental Congress, I should have liked to speak in the name of France—being one of the official delegates of the French Government and of the national federation—to recall to you all the ties of sympathy which unite our two republics. The fraternal relations existing since the time when you achieved your independence under Washington, with Lafayette and Rochambeau, are also of a professional nature, because of our common ancestors, Gardette and Lemaire, who brought over to America the French dentistry of the eighteenth century; and finally they are assured at the present time because of our common ideals of liberty, equality, and fraternity.

I left to my friend and co-delegate, Dr. Sauvez, the honor of speaking in the name of France, because I have today another duty, viz, to speak at this opening meeting in the name of an association which is above nationalities, since it is a universal association of national dental societies, a permanent international body existing in the interim of international dental congresses—in the name of this great association which you all know now as the great advisory council on dental international relationships.

The F. D. I. has taken a part in the work of this congress which for a while was surrounded by many difficulties. But now these are all over, and I bring you in the name of the F. D. I. a fraternal greeting. We can but congratulate you upon this first result, and now we turn over to you our powers, with all documents relating to the work accomplished since 1900.

The following statement, which is approved by all the members of the executive council of the F. D. I., will give you

an idea of the work which has been performed:

STATEMENT OF THE OBJECTS OF THE F. D. I.

The International Dental Federation is the child of the Third International Dental Congress. The resolutions creating it were passed on the last day of the congress. All of the representatives of national dental associations present in Paris in 1900 nominated members to be voted upon to form an Executive Council of seven or nine members, which council was to have authority to organize various commissions and also to determine the time and place for holding the succeeding congress after receiving invitations from different countries. In pursuance of its authority it met in Paris in 1900; in London and Cambridge in 1901; and organized a Commission of Education and one on Hygiene and Public Dental Service. In 1902 it voted to accept the invitation to hold the Fourth International Dental Congress in St. Louis, Mo., in August 1904. It organized a Commission on the International Dental Press at its meeting in Madrid, Spain, in 1903. At present there are three powerful commissions struggling respectively with problems of education, hygiene, and an international dental review.

The Federation is so constituted that its first period ends with the opening of the Fourth International Dental Congress, and that congress will provide for its perpetuation in the period intervening between the Fourth and Fifth International Dental Congresses.

It is within the power of the Fourth Congress to determine exactly under what rules and regulations (we present copies of rules and regulations for your consideration [see page 929]), and also the names of those who shall carry on this work if the Federation shall be continued during a second period. It is hoped that the congress in its wisdom may see fit to determine to inaugurate a second period for the Federation, and that it may be even more successful than the first.

As you will see by the official records of the sessions of the Congress at Paris, 1900; of the meetings at London and Cambridge, 1901; at Stockholm, 1902; at Madrid, 1903, and at St. Louis, 1904—which we are transmitting to your care together with a report of the secretary-general—you have a complete history of the work accomplished during our various sessions.

To conclude, let me tell you of my satisfaction in seeing that the F. D. I. has found in your great land this hearty hospitality, characteristic of the American dental profession, for which I thank

you sincerely. It is with the greatest confidence that I place its destiny in your hands, quite sure that it will continue to grow and to develop, as does everything here that pertains to the progress of science and to the good of humanity.

The PRESIDENT. If there is no objection this report will be accepted and referred to the Committee on Resolutions.

The secretary-general, Dr. Kirk, read the following cablegram from Dr. JOHN S. BURNETT, of Salto, Uruguay:

DR. H. J. BURKHART, *president Fourth International Dental Congress, St. Louis:*

Success to the Congress. I am mentally with you.
JOHN BURNETT.

COMMITTEE ON PRIZE ESSAYS.

The next order of business being the report of the Committee on Prize Essays, the President called upon Dr. Truman to present the report of that committee.

Dr. JAS. TRUMAN, chairman of the Committee on Prize Essays, then read the following report:

St. Louis, Mo., Aug. 29, 1904.

To the Fourth International Dental Congress:

The committee to whom was given the consideration of papers competing for the prize offered by the Committee of Organization begs leave to make its report to the Congress assembled at St. Louis.

Your committee decided upon the following rules for its government in considering papers presented:

1. The subject-matter must be new and original.
2. The paper must not be overloaded with quotations.
3. It must, in every respect, be in accord with the character and dignity of the Congress.

Ten papers have been presented and carefully considered. Several of these are so nearly up to the standard adopted that your committee has found some difficulty in reaching a united conclusion. It has, therefore, been regarded as proper and just, in deciding upon the paper worthy of the prize, to mention several equally worthy of "honorable mention."

The paper entitled "A Study of Certain Questions Relating to the Pathology of the Teeth," prepared by Professor W. D. Miller

of Berlin, is in the opinion of your committee entitled to the highest honor that this Congress can bestow.

The prize, therefore, is conferred upon his work.

The paper entitled "The Pathology of Lime Salts in Nutrition," by Dr. Med. C. Röse of Dresden, Germany, is regarded by your committee as one of the most thorough and valuable papers ever prepared upon this subject. It presents years of patient work, but unfortunately does not, and as yet cannot, go beyond clinical observation.

Your committee, therefore, report for "honorable mention" in the order of merit, the following:

1. "The Pathology of Lime Salts in Nutrition," by Dr. Med. C. Röse, Dresden.
2. "Constitutional Causes of Tooth-Decay, Erosion, Abrasion, and Discoloration," by Dr. Eugene S. Talbot, Chicago, Ill.
3. "Anatomic Changes in the Head, Face, Jaws, and Teeth in the Evolution of Man," also by Dr. Eugene S. Talbot.
4. "The Development of the Teeth of the *Sus domesticus*," by Zahnarzt Max Hirsch, Halle.

The balance of the papers, valuable for section work, have been transferred to the proper custodians.

Two papers were sent in for examination, but both were too late to compete for the prize: One by Dr. J. P. Michaels of Paris—not in the hands of the committee and title unknown—and one entitled: "(1) Investigations Concerning the Corrosibility of Aluminum; (2) Applicability of Aluminum to Dentistry," a very full paper upon this subject, by Hof-Zahnarzt W. Pfaff, Dresden, Ger.

With sentiments of respect, we subscribe our names.

WILBUR F. LITCH,
L. M. COWARDIN,
JAMES TRUMAN,

Chairman.

On motion, the report of the Committee on Prize Essays was accepted and adopted.

The Secretary-general then read a communication from the Dental College of Sheffield, Eng., as follows:

UNIVERSITY COLLEGE, SHEFFIELD:
DENTAL DEPARTMENT.

At a meeting of the dental practitioners held in Sheffield on Tuesday, July 19, 1904, it was unanimously decided to send their congratulations and fraternal greetings to the

members in meeting assembled at the St. Louis Dental Congress.

Also: The members of the Sheffield and District Association of Licentiates of Dental Surgery have pleasure in sending their heartiest good wishes to the members of the Congress at St. Louis.

The members of the above society have delight in announcing that their honorary secretary, Mr. H. James Morris, L.D.S.Eng., will attend the Congress and in person express their hearty good wishes for a happy and successful meeting.

GEO. HENRY LODGE, *President*,

CHARLES STOKES,

FRANK MORDAUNT,

Council.

H. JAMES MORRIS, *Treas.-Sec'y.*

A letter from Mr. W. H. Williamson, president of the British Dental Association, to Dr. M. H. Cryer, as follows, was

received too late to be read, having been delayed in transmission:

Kindly express to the officials of the Congress my great regret at my inability to be present, and at the same time convey the best wishes of the British Dental Association for the success of your great gathering.

I shall send a cable on the opening day in case this should not reach you in time.
—Yours sincerely, W. H. WILLIAMSON.

The PRESIDENT. If there be no objection the secretary-general is instructed to reply to all telegrams and letters to the congress.

There being no other business before the congress, the President declared the meeting adjourned until Tuesday morning at 10 o'clock.

(To be continued.)

RULES AND REGULATIONS OF THE INTERNATIONAL DENTAL FEDERATION

AS APPROVED BY THE FOURTH INTERNATIONAL DENTAL CONGRESS, AT ST. LOUIS, MO., 1904.

Statuts.

(a) La FÉDÉRATION DENTAIRE INTERNATIONALE est une association ou union universelle des fédérations dentaires nationales et des sociétés ou groupements dentaires qui lui ont donné leur adhésion.

(b) Elle a pour titre "Fédération dentaire internationale" et en abrégé "F. D. I."

(c) La Fédération dentaire internationale est la commission permanente internationale servant de lien entre les congrès dentaires internationaux.

(d) Elle est administrée par un Conseil exécutif composé de délégués représentant les divers pays. Ces délégués seront nommés par le congrès précédent. Le Conseil organise les diverses commissions jugées utiles pour faciliter le progrès de l'art dentaire à tout point de vue. Il est en même temps un comité consultatif international dentaire.

(e) La F. D. I. se réunit en assemblée générale avant l'ouverture des congrès dentaires internationaux.

(f) Le Conseil exécutif et les commissions se réunissent tous les ans. La ville et

Preamble.

(a) The International Dental Federation is an association or universal union of national dental societies and those affiliated therewith.

(b) The official title adopted is "Fédération Dentaire Internationale," abridged "F. D. I."

(c) The International Dental Federation is a permanent international body existing in the interim between international dental congresses.

(d) It is governed by an Executive Council, composed of delegates representing different countries (receiving appointment from the preceding congress). This Council organizes various Commissions that it deems will be beneficial to the advancement of dental science in any of its phases; it is at the same time an advisory committee on international affairs.

(e) The F. D. I. will hold a general meeting preceding the opening of each international dental congress.

(f) The Executive Council and the various Commissions will hold annual meetings, the

l'époque à laquelle ces réunions auront lieu seront fixés à la clôture de chaque session.

(g) Vœux adoptés par le 3ème Congrès dentaire international de Paris (1900) dans l'assemblée générale du 14 Août, créant la F. D. I.:

"11. Qu'il soit créé une Fédération dentaire internationale.

"12. Que les Comités nationaux formés en vue du Congrès actuel continuent d'exister et constituent la Fédération dentaire internationale."

Règlement.

ARTICLE I. La Fédération dentaire internationale, constituée par l'union des comités nationaux formés en vue du 3ème Congrès dentaire international de Paris, a été créée en conformité des vœux No. 11 et 12 émis par l'assemblée générale de clôture du 14 Août 1900 du dit congrès.

ART. II. La Fédération a pour but:

(a) L'acceptation ou le rejet des invitations faites par les divers pays de tenir un congrès dentaire international; la fixation du lieu et de la date de ce congrès.

(b) Le maintien et l'augmentation des liens qui rattachent les divers comités nationaux les uns aux autres.

(c) L'organisation des diverses commissions internationales qu'elle jugera utile de créer.

(d) D'une manière générale, l'organisation de tout ce qui peut contribuer à l'avancement de la science odontologique dans le monde entier.

ART. III. La Fédération dentaire internationale est composée:

(a) De tous les comités nationaux constitués en vue du Congrès dentaire international de 1900 ou de leurs successeurs.

(b) Des fédérations ou sociétés adhèrent aux congrès dentaires internationaux et acceptant ce règlement ou envoyant leur adhésion.

(c) Des sociétés ou fédérations de sociétés qui, par la suite, enverront leur adhésion aux présents statuts et règlement et seront acceptés par le Conseil exécutif.

ART. IV. Les fédérations nationales de sociétés ou, à leur défaut, les sociétés ou prati-

time and place to be selected at the close of each meeting.

(g) *Authority creating the F. D. I.*: Resolutions passed by the Third International Dental Congress (Paris, France), August 14, 1900, viz:

"11. There shall be organized an International Federation.

"12. The national committees appointed to this Congress will continue in office and will constitute the International Dental Federation."

Rules and Regulations.

ARTICLE I. The INTERNATIONAL DENTAL FEDERATION was organized by the national committees present at the Third International Dental Congress, at Paris, in 1900, and was created in conformity with Resolutions 11 and 12 passed by the general meeting on the closing day of that Congress, August 14, 1900.

ART. II. The objects of the Federation are as follows:

(a) The acceptance or rejection of invitations made by various countries to hold a regular International Dental Congress, and to fix the date and place where such congress shall be held;

(b) To maintain and strengthen the ties that bind the national societies to each other;

(c) The organization of such International Commissions as it may deem necessary to create;

(d) In a general way, to promote the organization of bodies that will contribute to the advancement of odontological science throughout the world.

ART. III. The International Dental Federation consists of—

(a) All the national committees gathered in Paris in 1900, or their successors;

(b) Associations or societies giving their adhesion to international dental congresses, and accepting these Rules and Regulations or sending their concurrence in them;

(c) Societies, or groups of societies, which may officially signify their acquiescence in these Rules and Regulations and which are acceptable to the Executive Council.

ART. IV. National dental associations or societies, or, in the absence of such, persons de-

ciens qui désirent faire partie de la F. D. I., doivent envoyer leur adhésion aux présents statuts et règlement. Cette adhésion est examinée par le Conseil exécutif, qui prononce l'admission.

ART. V. L'assemblée générale de la F. D. I., composée des délégués des diverses fédérations ou sociétés, se réunit avant l'ouverture de chaque congrès dentaire international. Elle peut être réunie par le Conseil exécutif en assemblée extraordinaire, en cas de nécessité.

ART. VI. Le Conseil exécutif pourra admettre comme membres de la Fédération.

(1) Des membres régulièrement délégués par les sociétés.

(2) Des membres honoraires.

(3) Des adhérents libres à la F. D. I. ayant été membres d'un congrès dentaire international, et qui enverront leur adhésion aux présents statuts et règlement.

ART. VII. L'ordre du jour de ces réunions sera fixé par le Conseil exécutif. Il porte sur les propositions émanant soit des fédérations dentaires nationales ou, à leur défaut, des sociétés, soit du Conseil exécutif, et il est communiqué aux fédérations ou sociétés participantes au moins un mois à l'avance.

ART. VIII. Le vote a lieu par délégué régulier. Sur la demande des représentants d'au moins deux fédérations, le vote pourra avoir lieu par fédérations nationales, un vote pour chaque pays.

ART. IX. Les réunions annuelles du Conseil exécutif et de ses commissions sont réglées par les articles précédents.

ART. X. La F. D. I. est représentée par un Conseil exécutif composé comme suit:

(1) Cinquante membres titulaires choisis par le congrès, à raison d'un membre pour chaque pays adhérent au minimum, et de cinq au maximum.

(2) En cas de vacance, par suite de démission, décès, ou de toute autre cause, le Conseil demandera à la fédération nationale représentée de pourvoir au remplacement du membre manquant.

(3) Les pouvoirs de Conseil expirent à l'ouverture de chaque congrès dentaire international.

(4) Le Conseil remettra à une commission

siring to become identified with the F. D. I., should send their acceptance of the present Rules and Regulations. Such applications will be acted upon by the Executive Council, who will accept them as members of the Federation.

ART. V. The general meeting of the F. D. I. will take place before the opening of each international dental congress. It will be composed of delegates from national or other societies. Extraordinary meetings may be called for special reasons by the Executive Council.

ART. VI. The Executive Council may admit as members of the Federation—

(1) Members regularly appointed by societies;

(2) Honorary members;

(3) Persons in good professional standing who have been members of international dental congresses, and who shall subscribe to these Rules and Regulations.

ART. VII. The program for these meetings will be prepared by the Executive Council. It will deal with matters emanating from national or other societies, or with questions proposed by the Council. Notices will be sent at least one month before these meetings to all affiliated societies, national or local.

ART. VIII. The right of voting pertains to regularly appointed delegates. Upon the request of representatives of at least two national dental associations, the vote may be taken by the said regularly appointed delegates in the mode of one vote for each country.

ART. IX. The annual meetings of the Executive Council, and of the various Commissions, are governed by the preceding Rules and Regulations.

ART. X. The F. D. I. is composed of an Executive Council, as follows:

(1) Fifty original members, chosen by the congress—that is to say, for each country as a minimum, one member, with a maximum of five members;

(2) In case of vacancy, by resignation, death, or other cause, the Council will ask the respective national dental association to fill the place of the missing member.

(3) The powers of the Executive Council will expire upon the opening of each international dental congress.

(4) The Council will hand over to a special

speciale nommée par le congrès ses documents et rapports à l'ouverture des congrès internationaux. Cette commission accusera réception par écrit des documents reçus.

(5) Le trésorier de la F. D. I. continuera à exercer ses fonctions jusqu'à l'élection de son successeur.

ART. XI. Le Conseil est administré par un bureau ou commission permanente de neuf membres, savoir:

- (1) Un président.
- (2) Trois vice-présidents.
- (3) Un secrétaire-général.
- (4) Trois secrétaires.
- (5) Un trésorier.

Le bureau du Conseil fait partie de droit de toutes les commissions, et les dirige jusqu'à la constitution de leur propre bureau.

ART. XII. Le Conseil exécutif a pour mission—

(a) De veiller à l'exécution du règlement de la Fédération.

(b) De fixer le lieu et la date des réunions internationales annuelles et des congrès internationaux.

(c) De réunir les diverses commissions internationales.

(d) De poursuivre l'exécution des décisions prises par la F. D. I.

(e) D'examiner les propositions ou résolutions qui lui sont soumises par les comités nationaux, fédérations, ou sociétés.

Le Conseil tient les diverses fédérations dentaires nationales au courant de ses travaux par le Bulletin du Conseil exécutif de la F. D. I., qu'il publiera en quatre langues: français, allemand, anglais, et espagnol.

ART. XIII. Le Conseil a déjà nommé les diverses commissions spéciales qui lui paraissent nécessaires:

(1) Commission de l'Enseignement dentaire.

(2) Commission d'Hygiène et des Services dentaires publics.

(3) Commission de la Presse dentaire internationale.

(4) Commission de Jurisprudence professionnelle, etc.

Le Conseil organisera une commission de Déontologie et une de Nomenclature.

ART. XIV. Les ressources de la F. D. I. sont constituées—

committee appointed by the congress all of its documents and records, at the time of the opening of the congress, said committee receiving for the same.

(5) The treasurer of the F. D. I. will hold office until his successor is appointed.

ART. XI. The Council is governed by nine Officers, as follows:

- (1) A president;
- (2) Three vice-presidents;
- (3) A secretary-general;
- (4) Three assistant secretaries;
- (5) A treasurer.

The officers of the Council are *ex officio* members of all Commissions, and will direct them until they are properly organized.

ART. XII. The duty of the Executive Council is—

(a) To supervise the execution of the Rules of the Federation;

(b) To fix the place and date of annual meetings, and of International Dental Congresses;

(c) To organize various International Commissions;

(d) To supervise the carrying out of decisions made by the F. D. I.;

(e) To examine propositions and resolutions offered by national committees, associations, or other societies.

The Council will keep all affiliated bodies informed of their work through the Bulletin of the Executive Council, which will be published in at least four languages, viz, French, German, English, and Spanish.

ART. XIII. The Council has already named several special Commissions, as follows:

(1) A Commission on Education.

(2) A Commission on Hygiene and Public Dental Service.

(3) A Commission on International Dental Press.

(4) A Commission on Dental Jurisprudence.

And it will organize Commissions on Deontology and on Nomenclature.

ART. XIV. The sources of income of the F. D. I. are as follows:

(1) Par les cotisations annuelles de ses membres, qui sont:

Pour les membres du Conseil exécutif, de 50 frs.

Pour les membres des commissions, de 25 frs.

Pour les membres honoraires ou libres, de 25 frs.

(2) Par le reliquat des caisses des congrès dentaires internationaux.

(3) Souscriptions, dons ou subventions des gouvernements, municipalités, fédérations nationales, ou individualités.

ART. XV. En cas de déficit, les dépenses de la F. D. I. seront supportées en parties égales par les fédérations ou sociétés adhérents. L'excédent sera versé à la caisse du congrès dentaire international suivant. Le Conseil exécutif soumettre ses comptes à chaque congrès dentaire international.

ART. XVI. Le Conseil exécutif enverra au Congrès une liste des membres les mieux qualifiés pour suivre les travaux de la F. D. I.

ART. XVII:

(1) Les congrès dentaires internationaux seront organisés par une commission de dentistes choisis de la façon suivante:

Un tiers du nombre de cette commission sera nommé par le Conseil exécutif de la F. D. I.; les autres deux tiers seront nommés par les groupement faisant l'invitation. Cette commission constituera la commission d'organisation, et tous ses membres auront les mêmes pouvoirs.

(2) A sa première réunion la commission d'organisation nommera un bureau composé d'un président, deux vice-présidents, un secrétaire-général, un trésorier.

(3) Le Conseil exécutif de la F. D. I. aura le pouvoir de décider toute question qui pourrait se développer dans la commission d'organisation.

ART. XVIII. Le présent règlement est adopté pour la période comprise entre deux congrès dentaires internationaux réguliers. Il peut être révisé au congrès suivant.

(1) By dues from the members, to wit:

Members of the Executive Council, ten dollars per annum.

Members of Commissions, five dollars per annum.

Honorary members and all others, five dollars per annum.

(2) Appropriations by congresses.

(3) Subscriptions, gifts from governments or municipalities, from national associations, and from individuals.

ART. XV. In case of deficit, the expenses of the F. D. I. shall be provided for by equal assessment on all societies having membership. Any excess above the receipts will be turned over to the next dental congress. The Council will give a detailed statement of receipts and expenditures to every congress.

ART. XVI. The Executive Council will send to the congress during its sessions a list of those members best qualified to carry on the international work of the F. D. I.

ART. XVII:

(1) International dental congresses shall be organized by a committee composed of dentists, who shall be chosen as follows:

One-third of its membership shall be appointed by the Executive Council of the F. D. I.; the other two-thirds shall be appointed by the inviting dental bodies. The committee so composed shall constitute the Committee of Organization, all the members of which shall have the same powers.

(2) At the first meeting of the Committee of Organization they shall organize and select the following officers of the committee: A president; two vice-presidents; a secretary-general; a treasurer.

(3) The Executive Council of the F. D. I. has full power to decide all questions in dispute arising in the Committee of Organization.

ART. XVIII. These Rules are operative during the periods between regular congresses. They are subject to revision by the succeeding congress.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Monthly Meeting, March 1904.

THE First District Dental Society of the State of New York, held a regular monthly meeting, Tuesday evening, March 8, 1904, at the Academy of Medicine, No. 17 West Forty-third street, New York city, the president, Dr. Henry D. Hatch, in the chair.

After the transaction of routine business, the president introduced Dr. R. R. ANDREWS of Cambridge, Mass., who read the following paper:

CALCO-GLOBULIN: A CONTRIBUTION TO THE STUDY OF THE PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS ATTENDING THE DEVELOPMENT OF THE TEETH.*

In one of the departments of the Peabody Museum of American Archæology and Ethnology—a museum connected with Harvard University—there are to be found some thousands of crania that belonged to a people who inhabited North and South America hundreds of years ago. This is an exceedingly interesting collection to study. An examination of these crania reveals to us the fact that there then existed, to some extent at least, most of the troubles arising from imperfection of structure, irregularity, and decay of the teeth, which we should expect to find in a like collection of crania of a recent people if it were possible that such comparisons could be made.

In contrast to these specimens, there are perhaps fifty skulls in this collection belonging to a people who once inhabited

the Sandwich Islands. In these we find a decidedly marked difference in structural characteristics of the teeth. In beauty of form, and in arrangement, they are as nearly ideal as possible. The teeth are of medium size, the enamel is found to be almost absolutely without pit or fissure, and flowing over the crown, thus forming literally a coat of mail which has protected the dentin absolutely from infection and decay. We naturally ask, Why is there such a contrast between the teeth of these two collections.

For ages, environment and hereditary influences have been known to influence the development of the tissues of a people. It is a destiny for good or ill given to them by their ancestors. In the case of the early people of the Sandwich Islands, judging them from these crania, we have a perfectly normal development.

The conditions of climate, habit, and methods of living all enter into a problem of this kind. We shall not consider these here. It is my purpose rather to tell you something about the formation of a tissue but little understood even among investigators, which will show you the causes of physiological or pathological growth in the formation of the teeth. This tissue is called calco-globulin. By it every part of the inorganic structure of a tooth is molded or formed. In describing this, I shall have to speak of the various processes taking place during development.

At about the end of the second and the beginning of the third month of intra-uterine life, in the embryonic tissue of the jaw we shall find the primary specialization of cells which are to form the dentin germ. It is in no special zone or layer of this connective tissue that the dentin germ is formed, but the formation seems wholly influenced by the contact

* This paper, which contains numerous extracts from former published papers, was not intended for publication, but was originally prepared to be read before the Alumni Association of Boston and Tufts Dental School. By request of the First District Dental Society of New York it is published with this explanatory note.

with an enamel organ first formed. In the presence of this organ, the connective tissue cells become stimulated and active. It would appear as though they offered a resistance to its further ingrowth, and from this resistance the enamel organ was made to expand, thus becoming flattened and broadened. The stimulation and activity of the embryonic cells is shown by their rapid growth, which clouds the part at this point, becoming a dense focus of new growth. The tissue is seen to be actively building itself up, and this results in the formation of a papilla, around which the enamel organ is growing like a cap or helmet. This process of new growth is a beautiful illustration of anabolic metabolism.

New cells are multiplying rapidly by nuclear segmentation. The phenomena which occur during nuclear segmentation are very complicated. Briefly, we may say in describing them, that during the first stage the nucleus undergoes changes preparatory to division, resulting in the formation of nuclear segments and the nuclear centrosomes. At the same time the spindle begins to develop. During the second stage, the nuclear segments, after the nuclear membrane has become dissolved, arrange themselves into a regular figure midway between the two poles, at the equator of the spindle. During the third stage, the daughter segments, into which during one of the former stages the mother segments have been divided by longitudinal fission, separated into two groups, which travel in opposite directions from the equator until they reach the neighborhood of the centrosomes. During the fourth stage, reconstruction takes place, vesicular resting daughter nuclei being formed out of the two groups of daughter segments, while the cell body divides into two daughter cells, and so new cells are formed.

The papilla grows to a cusp or cusps, and now becomes the dentin germ. At the end of the third and the beginning of the fourth month, the dentin germ is rather a homogeneous structure. Round cells are very numerous; they have relatively large nuclei and nucleoli. As the germ

assumes the cusp shape, multiplication of cells takes place around the blood-vessels which have grown into the base of the germ, and a jelly-like layer has formed around its outer surface. It will be found that the dentin germ will grow into the depressions of the enamel organ of a premolar or molar tooth, and these growths will become the dental cusps. We also notice that the different layers of the enamel organ are now formed, and that the sacculus is now forming its layers about both enamel organ and dentin germ. When this process is completed these are inclosed in a sac, and thus become a dental follicle. Within the area of the dentin germ are contained all of the cells which will develop later into the mature dentin and into the pulp of the fully formed tooth.

The round cells on the rim of the dental papilla appear to be in a protoplasmic substance, sometimes called a zone of amorphous material. It is a hyaline structure on the outermost surface of the germ. The cells just within become richer in protoplasm, and many processes are seen to be forming from them. They are becoming branched cells; a little later the cells at the surface grow larger and assume a columnar shape, which may be caused by mechanical compression. We also see just within this layer of cells some that are pear-shaped, conical, cylindrical, and spindle-shaped. There are some authorities who have spoken of what they call elementary cells on the outer layers, and from which, they say, the odontoblasts are formed, but I have never observed anything but globular masses, which are not cells. They are found in the protoplasmic substance of the rim spoken of above. At the beginning of the fifth month these cells on the surface are seen to be undergoing a histological differentiation, as stated above, and become odontoblasts. They are little more than masses of protoplasm. A marked change has taken place in these cells. As builders of a calcified structure, they differ from the surrounding cells; by a peculiar metamorphosis they have become specialized. They now become a physiological apparatus, a sort of chemi-

cal laboratory, if you please. In this condition they are unlike other cells, being unable to lead an independent existence. The builders of the calcified dentin and enamel have scarcely any membrane. The power of the cytoplasm of these cells, with its formative activity, creates, with the lime from the blood, minute bodies called calco-spherites. These are plainly seen to differ from the cytoplasm, by which they are placed so that they occupy a definite position of fixed form and structure. Thus it will be seen that the special function of these cells is to absorb the calcific material from the blood. Within the cells it is elaborated, and then given out to the calcifying tissue in an altered form. The calcareous matrix is not formed out of the protoplasmic layer alone. This protoplasmic layer, or protoplasmic exudate, has just previously been given out by the building cells, and now plays the part of an intermediary, by selecting its earthy matter from its environment. It has been stated by a recent writer that the phenomena of nuclear segmentation takes place in these specialized building cells; but this, I believe, is a mistake. Their function is mainly to build up the calcified tissues. How is this done? This problem we do not wholly understand, nor do we understand the physical or chemical properties of the building materials. At the time of calcification there is a perfect vascular system of arteries, veins, and an extensive capillary network near by.

As I have said, the details of the vascular mechanism by which the building cells are supplied with lime necessary to form calcified structure have not as yet been clearly worked out. Capillaries near the building cells do not communicate directly with the cells, and must therefore pass the lime through the intracellular substance. The inorganic calcium which is manifestly necessary cannot be supplied as such by the organic building cells, but must make its initial entrance into the body from without. This entrance in the fetal state must necessarily be through the maternal circulation, and after birth it must come from the food

which passes through the alimentary canal. From here it must be carried to the specialized building cells which superintend the process of dentinification, and there is but one such distributor—the blood supply.

After the absorption of food into the circulation by the intestinal epithelium, chemical analysis of the blood shows the presence of two calcium salts, the insoluble phosphate and the soluble carbonate. It can be readily understood that the soluble carbonate can be absorbed, but how the insoluble phosphate can be absorbed is still a mooted question. It is believed, however, that it is absorbed in that same loose chemical combination with proteid, in which it is found before absorption in the casein of milk and the yolk of egg. Chemical analysis has shown these two foods to be very rich in calcium. The casein and caseinogen of cow's milk, according to Bunge, contains more calcium to the liter than does lime-water. Caseinogen, according to Soldner, contains 1.65 to 2.36 per cent. of calcium. The proportion of calcium in combination with the proteid of egg-yolk has been found to be about the same.

The loose calcium-proteid combination, arriving, during its passage through the dental pulp-capillaries, within the radius of the special physiologic motive force of the odontoblasts, is acted on by this vital force, and thus becomes ingested by the cells. We believe that it here becomes modified by the cytoplasm of the cell through a chemical combination with its organic substance, and in this way calco-spherites are formed. Within the cells, these globules seem to have the property of coalescing, and as they are placed by the cell against the surface to become calcified, they are found to be, in many cases, large globular or irregular-shaped masses. These masses, merging with others, smooth out and form the layer always found between organic and calcified tissue, where the process of calcification is taking place. This is the layer known to investigators as borderland tissue. Hoppe-Seyler asserts that the lime which hardens dentin and enamel is a double salt of calcium carbonate and

phosphate, combining one equivalent of calcium carbonate with three equivalents of calcium phosphate.

The various processes of dentinification have been demonstrated to me by many hundreds of sections cut from developing teeth at a time when calcification was beginning, and from tissue prepared as near the life of the animal as it could be, and prepared with the least possible manipulation consistent with perfect specimens.

The formation of dentin from the dentin germ proceeds substantially in the following manner: We notice that the hyaline substance on the rim of the germ, which is a protoplasmic exudate that surrounds the outer ends of the formative cells, is filling up with minute, glistening, irregular-shaped masses that appear semi-solid, many of them being globular, but all tending to form by fusion a layer of a substance which is involving a portion of the outer ends of the odontoblasts. In this way, layer after layer is formed, until the dentin is completely calcified. The layer which is forming is a new product and a transition tissue. In this condition it is known as calco-globulin; a further chemical change forms it into the fully calcified structure. Thus the dentin is formed, layer by layer, and stage by stage. We cut our sections, if we are studying the forming dentin, at a period of growth covering one of these stages, and in our sections we do not always get the same picture. Sometimes our section will show the globular formative stage, sometimes in the stage that shows the continuous band of calco-globulin, and sometimes, though rarely, we get a picture that shows no appreciable layer between the odontoblasts and the calcified dentin.

This borderland tissue, calco-globulin, has its birth only after the substances which form it have passed out of the building cells. Here, by a perfect fusion of the calco-spherites with the protoplasmic exudate, calco-globulin is formed. It is a transition tissue, which is to become calcified. In it the lime is held in some sort of a chemical combination not yet understood. It is retained very obsti-

nately, and is exceedingly resistant to the action of acids, caustic alkalies, and boiling water. Investigators do not seem to understand this tissue. A recent author tells us that "calco-globulin, although appearing in the building cells, is really formed in the cells farther away from calcification." The globules that appear in the building cells that he speaks of were really calco-spherites. One who knew what calco-globulin was would not make such a misleading statement. The same author also makes this misstatement: that "the globules of calco-globulin are quickly destroyed by acid treatment." Other authorities have told us that there exists no calco-globulin in the formation of the dental tissues—while all the evidence tends to show that none of the calcified tissues of the tooth could be formed without it. As one layer of this substance calcifies, another forms, and so on. The dentin shows this layer formation especially well during development. This nutritional condition is repeated over and over again, until calcification is complete. Understanding this, one can readily perceive the effect of disease, or of the lowering of the vital forces at this time. Some of the layers are sure to be imperfectly formed. The fusion of lime and protoplasmic exudate is incomplete. Calco-globulin is abnormally formed. Such a condition is always found in rickets and other diseases of infancy. Calco-globulin forming during this period of dentition is abnormal, and all teeth calcifying at that time are affected, sometimes to such an extent that the tissue is shrunken and shriveled, so that grooves are formed across the faces of the forming teeth, and we have also what has been called rocky enamel.

Our writers have hardly given these facts the importance they deserve. In the process of normal formation, the layer of protoplasmic exudate is sometimes quite thin, sometimes thicker. When this layer is formed the microscope reveals within the substance of the building cells, and in the region of the nucleolus, myriads of minute, glistening globules. As they are seen near the mouth of the cell, some are larger, as though

they had merged with others. They are the calco-spherites, and are seen to be pouring out of the cell and filling the protoplasmic exudate, where, by coalescing or fusing with it, they form a blended layer, having no appearance of globular formation. The normal structure is completed by every layer forming in this manner, and we have perfect dentin. On the other hand, in diseases of infancy and early childhood, when the vital forces are impaired, the formation of this layer of calco-globulin is incomplete, as I shall show. Whether the substance of the protoplasmic exudate is affected or not by these nutritional changes is not certainly known. Under the higher powers of the microscope it shows no difference in structure. A decreased vitality would probably cause it to be weakened and defective to a greater or less degree. Malnutrition would show its effect here, as well as in the lessened supply of lime from the blood, and the character of the exudate formed during the diseases of early infancy must necessarily be below the normal. I think it fair to assume that the tissue is affected, in that it is formed during a perverted development.

In the formation during disease of a layer of calco-globulin, there is a deficiency in the supply of the calco-spherites. They are given in to the protoplasmic exudate sparingly. In it the globular bodies are unevenly fused. Under the microscope we see masses of globules which have calcified as islands, not perfectly filling the substance in which they rest. Some of these globular masses are seen clear and distinct, others are indistinct, as if just out of focus. Some are perfect spheres, others are fused together, having a mulberry-like form. In fact, the alteration of the developmental force is most marked. These imperfectly formed layers may continue to be formed during the period of the disease. When health returns, normally formed layers develop, and the imperfect ones are closed in from the nutritional impulses of the receding pulp, and their condition or substance, which is imperfectly formed or transitory, thus becomes an area of abnormal formation. The globular masses

in these imperfectly formed layers are calcified structures. The protoplasmic exudate which surrounds them seems little changed. Some writers speak of it as an interglobular cartilage. The dentinal fibers seem to pass indifferently through both these hard and soft structures.

These imperfect or partially calcified layers exist in the dentin in different degrees. In some sections which we examine they have the appearance of contour markings. In other specimens which have been formed during the diseases of infancy, the whole substance of the dentin seems to be a conglomerate mass of globules, having the interglobular spaces filled with the interglobular cartilage.

Calco-globulin exists as a much more stable structure in the linings of the dentinal canals. It may remain here as sheath tissue for years with little change. It is formed as follows: As each dentin-forming layer calcifies, the fiber, which has its origin from fiber cells in the pulp, lengthens, and against this lengthening fiber this same calco-globulin layer is formed, as it is against the forming matrix next the building cells. This so-called sheath tissue, then, is formed of calco-globulin. It is a part of the matrix, and is in no sense a separate tissue. Tubes can only be demonstrated after full decalcification, when acids or caustic alkalis have completely destroyed the calcified matrix. In sections of dentin this sheath tissue can be stained by a preparation of silver nitrate. It acts precisely the same as it does on the calco-globulin layer of forming dentin; it stains it black. It is, then, a part of the matrix in a partial state of calcification. Full calcification may take place in this more stable form of calco-globulin as age advances, when the diameter of the dentinal canals is found to be less than in the young teeth.

(Fifty slides were shown on the screen.)

Discussion.

Dr. J. BETHUNE STEIN. I feel so overwhelmed with what Dr. Andrews has

shown us this evening that I can scarcely say anything. There is so much to study. We have before us one of the most beautiful histological structures to be met with; one we know little about, and one which will take much time to elucidate. There are many things he said that impressed me; one in particular, What is this calco-globulin? He said he did not know what it was, and practically that nobody knows what it is. We use the term, and it implies that it is a proteid material. We know that globulin or any other proteid is not an inorganic substance. Dr. Andrews also said calcium was loosely combined with this. The term "calco-globulin" is a misleading one for a student in any branch of medicine. We do not find it in the journals; we seldom find it in the dictionaries. It implies a loose chemical combination, and I think he meant that it was such. He afterward said, when he spoke of the cementum and of the tooth still living after we devitalized it, that it derived its nourishment from the surrounding vessels, and therefore it might be similar to the manner in which we think bone is nourished—partly from the blood-vessels, and partly from the exudation, which is really lymph. If we liken the tubules to the canaliculi on the other side we have practically the same condition.

Again, it seems to me we are making things more difficult for ourselves when we think of the enamel as a differentiated structure. We know that in the process of differentiation we have the hard enamel from the same ectoderm which forms the nervous system, etc. They are different structures and different in their function. I have often thought, and some of the books speak of it, What is this reticulum? We say it comes from the ectoderm, along with the enamel cells. It looks like embryonic tissue. It is not, but, as the layer of which Dr. Andrews speaks grows inward, possibly some of these other cells also follow in, and we get our enamel groove, as he called it. He said he could not explain it, that it had no function, that possibly the surrounding tissue was vascular. We

know the underlying connective tissue is endowed with a great amount of lymph, and possibly there is an effusion of this lymph. It is the calcium which we know exists in the blood, calcium phosphate and also a combination of the calcium phosphate and the calcium carbonate. The blood probably passes it over to that tissue. It seems reasonable that it should, although I do not say it does so. These cells as well as other epithelial cells may take up a substance and elaborate it, and then throw it out the other side. So may these cells form the calco-spheroids on the other side, and gradually the enamel be built up. We saw proved to-night in this demonstration the fact that the other side, where we had the so-called dentinal papilla, as it grew up, at the base of it the vessels were very large. Around the edge Dr. Andrews shows us bloodvessels where we would expect to find odontoblasts. The specimens did not show as well as they should. In all probability we have the same process taking place there. The question of the enamel and the question of the formation of dentin, and the question of those dentinal tubules in the canaliculi, or the dentinal tubules in their reaction to silver nitrate, we must wait for the chemist to solve; and it is a question which will take men that are well trained in microchemical operations to demonstrate. It only goes to show the importance of the instruction of the dentist of today in organic chemistry, and his careful training in microchemical operations.

I do not think there is anything more I can say regarding the paper this evening, but that it was an unbounded satisfaction for me to hear it and to see those beautiful slides upon the screen. I thank Dr. Andrews and the society for the opportunity of being present and of receiving a great deal of instruction.

Dr. M. L. RHEIN. This society certainly feels honored (and it is not the first time that we have been so honored) by a paper from Professor Andrews. One of the pleasant historical recollections of the First District Dental Society has been the contributions they have received from Dr. Andrews; and this has

been none otherwise than those that have preceded it. I do not propose to say anything in regard to the beautiful exhibition of technical skill in the presentation of the slides projected on the screen this evening, or in reference to Professor Andrews' detailed ideas in regard to some of the questions; but in listening to the paper I was forcibly struck with its practical adaptation to us as practicing dentists. The matter has been frequently put to me by different medical men relative to the condition of the teeth especially of rhachitic children, and it is in regard to this one practical question that I might say a word. The paper gives us a most practical lesson there—the malformation and the irregular form, and the lack of enamel deposit, as seen in these children. It is very important that we should be able to inform the parents of such children and their attending physicians of the reason for this condition. There is no excuse at the present day for some of the erroneous statements and assertions constantly brought to our attention as to why these perversions of structure present themselves. A presentation of this kind is an object lesson to every dentist, and enables him to answer the parents and physician properly on these questions.

There is another phase that I want to touch upon, and that is, how to prevent this condition. It has always been my idea that where the dentist has the confidence of his patient, it ought to be brought to his knowledge, as well as to the knowledge of the attending physician as soon as the mother becomes pregnant. It is in the early stage of pregnancy that the dentist is frequently in a position to give the most valuable advice to the mother; not so much for the health of the mother, but that she may begin to take care of the future teeth of the child *in utero*. It is to this phase of the question—from a practical standpoint—that I want your attention directed. I have been told in the course of years of some of the most astounding recommendations to mothers during this trying period of their life, given to them by physicians, not with the object of bringing into this

world children who are normally and physically formed, but to enable the mother to produce those children with as little pain as possible. They have advised the non-use of such food materials as would tend to the production of these calcic formations that Professor Andrews has shown us so clearly tonight bear such an important relation to tooth-formation. I have no doubt that all of you have run counter to this same proposition from some physician—the advice to mothers to abstain from food that contains real nutritional material. It has frequently been a source of extreme gratification to me that I have been able to obviate such a pernicious doctrine as this, and I think it is a very important practical point that we can deduce from the paper this evening.

There is one other point that suggested itself to me in regard to the beautiful elucidation that was given us of the canaliculi, and the necessity of maintaining in those canaliculi, after the pulp has been removed, as far as possible a condition of health if the tooth is to be retained in a healthy condition afterward; that is to say, as to the nutrition that proceeds from the pericemental tissue, and is a source of nourishment to the dentin after the pulp has been removed. In order to leave a tooth in such a condition, there comes up the one point with which I will close, and that is, the scientific closing and sealing of the root-canal, so that the living portion of the canaliculi shall be maintained intact during the remaining lifetime of the tooth.

Dr. JOHN I. HART. This is one of the many interesting and instructive papers it has been my pleasure to read or listen to from Dr. Andrews, and on this occasion I might say I feel proud, sir, to be a dentist. It is not a case of asking why certain things happen, but we are now able to explain satisfactorily to ourselves that they happen because of certain phenomena which may be pathological or at least anomalous. They happen from definite causes which, although we may not be able to control them, we can recognize. We have clinically recognized that under certain conditions

enamel formation is unnatural, and that the dentin is improperly calcified. Czermak called attention to the spaces described by Dr. Andrews so beautifully tonight, and we have recognized that certain teeth, as they erupted in pairs, have presented marked irregularities, while other teeth calcifying at other times were almost perfect; and after studying a paper of this kind we can realize how faulty metabolism brought about by impaired nutrition in the individual, or how faulty nutrition in the parent, may interfere with proper deposition of the lime salts. This union of albumin and lime is one of the important factors we have to deal with. If the lime and albumin do not unite properly, then the tissue we work on constantly is not in a condition to resist the inroads of caries. They are not only in a condition where they will not resist the carious process at some point of the enamel, but more particularly in the developmental grooves are they improperly protected against these inroads. If the dentin be improperly calcified, if we have any material amount of these spaces of improper calcification, then in little or no time the pulp becomes involved, and we pass from a mere simple carious process to an invasion of the pulp, and finally it is lost. Unfortunately, this so happens frequently prior to the proper completion of the roots of the teeth, that as a class we are losing pulps of teeth which former generations saved intact.

Now comes a question that was evolved by the speaker before me, as to whether we are able to change this condition by a different character of food to the mother. There have been many arguments on the other side. It has been shown conclusively that where those very elements were given to the mother, in certain conditions those elements were thrown off, and were not absorbed by the being *in embryo*. So it resolves itself into my first proposition, and that is, proper metabolism—and that goes back to the first principle of life. In this age of nervous excitement, lack of exercise, and improper living, we have to improve other factors besides food.

Dr. HATCH. I would like to ask Dr. Andrews why we do not get those grooves which can be observed macroscopically in deciduous teeth? I would like to know also concerning those cases of so-called atrophy in the permanent teeth with which we are all familiar, where a groove as large as the end of a lead pencil will appear, across a pair of incisors for instance. How long a period of illness or of lowered vitality would it take to produce such a groove as that? Are we justified in saying to the mother that the condition was produced by such or such an illness?

Another thing I would like to ask is, Conceding that, on account of the anastomosis of the terminals of the dentinal fibers, life is given to the dentin by way of the peridental membrane when the pulp is dead, how far toward the pulp can the dentin be alive when the pulp is dead?

Dr. J. F. P. HODSON. I would like our essayist to have interpolated in his finished paper, when published, a statement as to what year this formation had taken place; whether it was *in embryo*, or so long after birth, or when the first teeth erupted, or when the second teeth erupted, etc. It would be a very practical addition to our professional knowledge.

Dr. ANDREWS. In the case of the deciduous teeth, the crowns are formed at birth, or nearly so. In the permanent set, faulty formation from disease would occur about as follows:

Between the first and second year we should expect to find the cutting edges of the central incisors, lateral incisors, and first molars affected; the central incisor's cutting edge forms a little earlier than that of the lateral incisor, which we should expect to be less affected. The first molar forms earlier than the central incisor and about a line (one-twelfth of an inch) of that is formed.

Between the second and third year the imperfect tissue would be found a little more than a line below the cutting edge of the incisors. It would involve the forming point of the canine, and be found on the first molar about one-third

the distance between its cusp and the gum.

Between the third and fourth year the defect would be found about midway between the cutting edge and the gum. It would affect the canine a little more than a line from the point of its cusp. It would affect the points of the bicuspid. The first molars would be affected about halfway between their cutting edge and the gum.

Between the fourth and fifth year the imperfect structure will be found on the incisors near the gum. On the canine midway between its cusp and the gum; on the bicuspid about a third of their length from their cusp; on the first molar at about the gum line. At this time we should expect to find the cutting edges of the second molar affected.

At the sixth year imperfections would be found at the base of the lateral, across the lower third of the canine, across midway between the cusp and the gum of the first bicuspid, the upper third of the second bicuspid, and the upper portion of the second molar.

At the seventh year we should find imperfect structure at the gum line of the canine and bicuspid. It would affect the second molar at this time, midway between its cusp and the gum.

At the eighth year disease would affect the lower portion of the crown of the second molar and the cutting edge of the third molar, which at this time is just forming.

In regard to Dr. Hatch's question: Were you speaking of an abraded groove that we find near the gum?

Dr. HATCH. I did not mean an abrasion. I meant that condition where the enamel has never been formed—those grooves spoken of usually as atrophy, where the permanent teeth have never had any well-formed enamel on them—of grooves across the faces as large as

the end of a lead pencil, roughly speaking.

Dr. ANDREWS. That is due to perverted nutrition. While the crown was forming there was weakness or illness which kept the natural forces from working normally. It is impossible to answer those questions absolutely. We have every reason to suppose that such changes are taking place under pathological conditions. They are not natural. I wish I could answer more definitely.

I have seen the condition in the temporary teeth—those grooves of disease that must have taken place perhaps from the mother's condition, and not from the child's, or perhaps the embryo's and the mother's together; but we do not see it as often as the other. A tooth forms just so far in a nearly normal condition; then the nutritional forces are impaired, from some reason or other; then, when health returns, the normal tissue will form again, and when the tissue is formed we find the imperfect structure. That is the way the grooves are formed, as seen under the microscope in studying these questions.

Dr. HATCH. How deep can dentin be living, if the pulp be dead?

Dr. ANDREWS. That is a difficult question to answer. I should judge it has a good deal to do with the individual. I do not believe anybody can state how far live fibrils from the cementum can run in, or what amount of the dentin fibrils are alive. It has to do with the health and condition of the individual.

I do not know that I have anything more to say. I have been very much pleased with the discussion that has been brought out.

On motion a vote of thanks was given to Professor Andrews for his very excellent and interesting paper and demonstration.

B. C. NASH, *Secretary*.

MASSACHUSETTS DENTAL SOCIETY.

Fortieth Annual Meeting.

THE fortieth annual meeting of the Massachusetts Dental Society was held in the Massachusetts Charitable Mechanic Association Building, Huntington avenue, Boston, Wednesday and Thursday, June 1 and 2, 1904.

FIRST DAY—*Afternoon Session.*

The meeting was called to order at 3 o'clock Wednesday afternoon by the president, Dr. Wm. P. Cooke, Boston.

The next order of business after the reading of the President's address was a paper by DR. ARTHUR E. PECK, Minneapolis, Minn., on "A Transmissible System of Porcelain Inlay." (Printed in full at page 904 of the present issue of the COSMOS.)

Discussion.

Dr. S. S. STOWELL, Pittsfield. I understood Dr. Peck to advocate the use of cores in the baking of porcelain. I would say, gentlemen, don't do it.

Dr. PECK. I did not mention the use of cores. Contour fillings made by this method are baked in a platinum mold, therefore a core would not be needed, it being the purpose of the core to assist in holding up a contour restoration.

Dr. STOWELL. But did you not say that a core would prevent shrinkage?

Dr. PECK. The core will prevent some of the shrinkage when used, but is not needed with this system.

Dr. STOWELL. Does it not assist in forming the contour?

Dr. PECK. Not with this method.

Dr. STOWELL. In that case, then, the core is not necessary? Is the shrinkage noticeable?

Dr. PECK. No.

Dr. STOWELL. How many bakings do you usually make for an inlay?

Dr. PECK. That depends somewhat on the size of the inlay and the material used. I do not limit myself to any special number of bakings, I frequently bake three, four, or five times.

Dr. STOWELL. I would like to ask with regard to these colors, if we could not use an ordinary plate tooth, discarding the pins, and pulverizing the tooth. Would not that do just as well as what you have shown us?

Dr. PECK. Yes, only the tooth must be of one solid color.

Dr. STOWELL. Wouldn't any old plate teeth we have around the office do for that if pulverized?

Dr. PECK. It would, if all the undesirable color were ground out. That is sometimes quite difficult to do; it therefore makes an element of uncertainty which is obviated by the use of the pinless one-solid-color tooth which I have shown you.

Dr. W. H. POTTER, Boston. I would like to ask what cement the essayist uses, and whether he uses the rubber dam in setting the inlay?

Dr. PECK. I use Britton's cement, yellow powder, to take the impression, and I set the inlay with Harvard cement, always using the white powder, because it gives but one shadow reflection to obviate, and we soon learn how much lighter to make the inlay to overcome this shadow. I never use the rubber dam while setting the inlay.

On motion Dr. Peck's paper was passed, and Dr. N. A. DEWITT, Cambridge, read a paper on "Immediate Root-Filling." (Printed in full at page 908 of the present issue of the COSMOS.)

Discussion.

Dr. G. A. MAXFIELD, Holyoke. I was glad to hear the closing sentence of this paper. The author speaks very positively of the successes resulting from his methods of treatment, but in closing he frankly admits that he has some failures; that he does have to remove a filling sometimes on account of inflammatory conditions that occur after he has treated and filled the canals. Now, all who are thorough and conscientious in their treatment of pulpless teeth will record some failures. We seem to go on for some time having nothing but successes, then all at once we will have a number of failures, and a very singular thing about this is that these failures seem to come together.

Lately I have been having a series of failures. Within the last two weeks I have had two failures. Last Friday I removed a live pulp from a lower molar, using pressure anesthesia. I had no trouble with the anterior canals, but there was some sensitiveness in the distal canal. With the hypodermic syringe I injected cocain into this canal, and removed the remaining portion of the pulp. I immediately filled the canals with gutta-percha such as I have filled canals with during the past eighteen years. On Monday morning the patient came to my office saying he had not slept any since midnight last Saturday on account of the pain in his tooth. The tooth had been all right until midnight Saturday. I immediately removed the filling from the distal canal and applied a dressing, expecting it would quiet in a few minutes. While it gave some relief the trouble continued and he came in again this morning. I then removed the dressing, pumped creasote and chloroform into the canal, and then sealed up the cavity again. In the course of half an hour the pain was gone, but the root remained sore to the touch. I do not know what I may find when I return, but I instructed him to go to a neighboring dentist if the trouble continued, and have everything removed from the cavity and canal, leaving it open. The part I cannot understand about these cases is that they do not give trouble immediately, or what should

cause them to give trouble after they are filled. Last week I opened into a tooth in which the pulp had been dead for several years. When it was first filled there had been no attempt to clean out the dead pulp or to treat the canals. The amalgam had been forced into the pulp-chamber, and I found it in a foul condition. I cleaned the canals as thoroughly as possible, and proceeded as I do in all such cases; that is, I place dressings in the canals, with temporary filling in the cavity, letting them remain a week before attempting to fill. This tooth did not give any trouble till four days afterward. Usually trouble occurs, if at all, within twenty-four hours, and I cannot understand what should cause the trouble in this case so long after the tooth had been opened and treated.

Dr. S. S. STOWELL, Pittsfield. I would like to say a word on the line of the essay under discussion. I have used hydronaphthol in combination with cement for root-fillings for fifteen years, and my failures have considerably diminished in number along that line. I think the essayist is on the right track in using hydronaphthol and cement in the combination in which he uses it.

Dr. F. B. HICKS, Brookline. In the cases referred to by Dr. Maxfield, I would like to suggest the possibility of some of the root-filling material being forced through the foramen and causing an inflamed condition. I have known cases of this kind.

The preparation which I use for treating root-canals for immediate filling is sodium hydrate. It is placed in the canal before it is cleansed and is allowed to remain there ten or fifteen minutes. This application is followed with hydrogen dioxide to wash it out, when a little chloroform and aristol are applied, and the canal is permanently filled with gutta-percha.

Dr. W. W. MARVEL, Fall River. I would like to ask Dr. DeWitt if he would use that material following an abscessed condition.

Dr. DEWITT. When a tooth comes to me in an abscessed condition, with the tissue swollen, I get rid of that condition

first, as I should not attempt to put a filling into a tooth when it is sore to percussion. If the tooth is not sore to percussion, I should certainly use this material.

Dr. MARVEL. But you ultimately fill with this material where you have an abscessed condition to relieve?

Dr. DEWITT. Always. I use it for every root-filling that I put in.

Dr. W. H. GILBERT, Malden. I would like to ask how soon after the pulp is destroyed the doctor puts in this root-filling?

Dr. DEWITT. Just as soon as I have stopped the hemorrhage.

Dr. GILBERT. And in your experience, you have had no soreness to follow?

Dr. DEWITT. I have had it in very few cases, but as Dr. Maxfield says, we will all have failures occasionally. Once in a while I find a tooth that I do not believe anybody could treat without having basis for complaint, but I attribute this more to some idiosyncrasy of the patient than to the method used. There are systemic conditions that affect this work materially, and a good many cases of trouble can be attributed to systemic disorders or susceptibilities.

Dr. A. J. FLANAGAN, Springfield. I think the essayist did admit that occasionally he had trouble. I think if that statement is analyzed we will come to the conclusion that it is not so much a question of material as it is of how the work is done. I do not care what material you use, the first requirement in successful treatment of teeth is a thorough mechanical or chemical removal of deleterious matter in the root or roots. It is not a question of material, but a question of instrumentation; that is the first requirement. I do not think it makes much difference in the long run whether you use eucalyptus, creasote, iodoform, or a dozen other medicaments; if the material inserted in the root is impervious to moisture, and you are reasonably sure that the apex of the root is sealed up, you have done as well as the average practitioner can do. When we have a patient coming to us from a brother practitioner who has used cotton or some other ma-

terial that we do not approve of, it does not do for us to criticize him too severely, because many of our cases perhaps go to our brother after we have used our most successful treatment. The question of the worth of the many materials in preventing future trouble is about as the old farmer said, "six of one and half a dozen of the other."

Dr. DEWITT. I think Dr. Flanagan has the six on the wrong side. There is certainly more antiseptic power in the preparation I have advocated than in chloro-percha. I do not think that any man here, even after he had thoroughly cleansed the root would attempt to immediately fill it with chloro-percha. You may do it, but I think it must mean work for you later.

Speaking of canals in teeth that have been dead for some time, most of us thoroughly cleanse them first, put in a dressing of eucalyptus and cotton, or something else, and leave it there for a week; then, when the patient comes back to us the second time, we wash the canal out with hydrogen dioxid, or in any way we are accustomed to, and put in another dressing and allow it to remain another week. Now, gentlemen, that is wasting time, both our own and the patient's—and the patient's time is quite often as valuable as ours—and this is an expensive procedure. If you can fill that canal immediately, and be sure you will have no more trouble, what is the use of putting in a dressing and leaving it a week, and then going over the same procedure again before filling the canal?

Dr. FLANAGAN. I did not approach the subject of the previous treatment of the canal or canals. I was talking of filling material in root-canals. I would like to ask the essayist if he considers it the best practice to use powerful coagulants in the treatment of these canals? If he is a believer in the tubuli of the tooth running through to the pericemental tissue, he cannot help but believe that germicidal agents powerful enough to destroy these germs may also at times irritate the pericemental tissue.

Dr. DEWITT. I think the great num-

ber of these cases where we have trouble is in the tissue outside of the tooth, and caused probably by a little of the filling material being forced through the apical foramen. So far as its going through the tubuli of the teeth, I do not think it would do that.

With regard to chloro-percha as a root-filling, I have some chloro-percha that was prepared three years ago, and I wish you could see it now. It was placed in a glass-stoppered bottle, with the stopper as tight as it could be placed in the bottle, and I wish you could see the amount of shrinkage that has taken place from the evaporation of the chloroform. It is probably more than would take place in a tooth, but if it will shrink this much in those conditions, it would certainly shrink in a tooth. With the material that I use, I believe the root will stay permanently and perfectly filled, whereas it will not with the chloro-percha.

Dr. G. A. MAXFIELD. I know from my own experience in treating root-canals that medicines will penetrate the tubuli of the teeth. Several years ago Dr. Kirk published a paper on the use of coagulants in root-canals,* which created much controversy. Many claimed that a coagulant applied to the canal would seal up the tubuli, also the end of the canal, so that medicines would not penetrate the tubuli or beyond the apex of the root. The first experiment I made in removing a live pulp was from a tooth in my own mouth. I immediately filled the canal and cavity, and the next day I began to have trouble, which continued at times for over two months. It felt as though there was pressure on the nerve in the tooth. I finally reasoned it out, that after the influence of the cocain had passed away, there was life in the portion of the pulp that must have been left in the apical end of the canal, the bulbous portion of the root. So I removed the filling and pumped up carbolic acid—full strength—thus cauterizing it. Then I immediately refilled the canal and cavity, and have had no more trouble. Since then, in all cases after the removal of a

live pulp, I have given the canals this treatment. About the time of Dr. Kirk's paper I tried zinc chlorid instead of carbolic acid, thinking I might get better results. In three cases I had severe irritation in the pericemental membrane which I was confident was due to the zinc chlorid. As this confirmed the claim made by Dr. Kirk I wrote an account of them for him, which was published in the "hints and queries" department of the *COSMOS*.*

In regard to filling pulp-canals I do not believe in using a material that cannot be easily removed. A number of years ago I treated some teeth for a lady, three of which had abscesses on them. These had healed up, and the teeth were filled. Seven years afterward she was taken ill with diabetes, and these abscesses broke out again. I succeeded in curing them again, but the lady died some three months later.

I recall another case where a short time after the canals were filled the patient had a boil on the back of his neck. Then an abscess developed upon the filled tooth, and I had to remove the fillings and treat the canals. In both of these cases the abscesses were caused by the systemic condition, and if the fillings could not have been removed from the canals I do not think the abscesses would have healed. So I say, to be on the safe side it is best to use a filling in the canals that can be easily removed.

Dr. W. A. CURRIE, Cambridge. I agree with the gentleman who spoke last, that the best thing to fill pulpless teeth with is some material that can be readily removed. I have in my practice a great deal of canal work, having made something of a specialty of it, until now it constitutes fully one-half of my operative work. I have followed the subject in our literature, reading everything I could find, until now I have come to where I feel confident of my work and of myself. When the sodium-potassium treatment for pulp-canals came out some years ago, I gave it a fair trial and, elated with the results, adopted it very largely, continu-

* See *COSMOS*, 1894, vol. xxxvi, p. 181.

* *Ibid.*, 1895, vol. xxxvii, p. 162.

ing its use to some extent until the present time. There are several preparations and treatments now available that have been before the public sufficiently long to prove their worth. For filling canals of pulpless teeth, I am now using extensively chloro-percha, first sealing the apex of each root with Oxpara, or some one of the many good preparations for that purpose. Then, after placing a drop or two of chloroform in the canals, I gently introduce a gutta-percha point, forcing it cautiously as the point softens until the canals are quite filled. The bulk of the cavity is filled with Harvard cement, finishing if necessary with something more resistant to the oral fluids.

Should trouble recur—and it is bound to come to every practitioner in some cases—this filling is readily removed, and the patient quickly relieved from suffering.

Taken all in all I think the great fact to keep before us is perfect asepsis in every act and with every instrument and material.

Dr. W. H. POTTER, Boston. I would like to call your attention to zinc oxychlorid as a reliable root-filling. There is enough free zinc chlorid in this preparation to produce a decided antiseptic effect.

Will the essayist give us the exact formula of the cleansing preparation which he uses? Does it differ from sodium dioxid?

Dr. DEWITT. The sodium-potassium that I use is a preparation put up by The S. S. White Co., a box containing six glass tubes. It is metallic sodium and potassium. The material should be used in very small quantities. The amount that will cling to the barbs of a broach is sufficient for use at one time. The only thing is to avoid getting too much in the tooth, as there is danger of explosion, and you want to be very particular in getting a very minute quantity at a time. There are many cases where there is not much of a root left, and one side seems to be more decayed than the other, with the gum hanging over the edge of the canal; this preparation applied there will cause the tissue to shrink right away, and when

you have used it in the canal it will look as though it had been scrubbed with a brush.

Dr. N. MORGAN, Springfield. I simply wish to ask one question with regard to his preparation of the canals. That is, if the essayist uses canal reamers, and if so, to what extent? Sometimes a great deal of the success in treating root-canals depends on the mechanical treatment of the root.

Dr. DEWITT. I use reamers every chance I get, but I make them myself. I use for this purpose the Downey or Kerr broaches; they are twisted broaches. These are soldered on to old bur shanks, and you have a canal-drill that is very useful. You can make these any size and length you want and can get into almost any canal. I always ream out canals if I can get at them, because it affords access and makes the whole work easier.

Dr. FLANAGAN. If the doctor can get such a clean condition as he speaks of, why does he waste the time in drilling out the canals.

Dr. DEWITT. It is simply for the sake of getting better access into the canal. We find the canals in a great many instances very tortuous and very hard to get into with a small broach, and in those cases, if we can ream them out, we get better access to the canal and it makes our work easier; that is what we are after. I do not enlarge the canal for the sake of getting rid of the dead matter, but simply for the sake of getting more room. Certainly, with a large canal and your work well in sight, you can get better results.

Dr. A. J. FLANAGAN, Springfield. An old campaigner at dental conventions could well say that there are three subjects which always receive the most attention from the audience, and while they have perhaps received more attention and discussion than others, yet the fact remains that we are still in the kindergarten respecting their exact nature. These are, first, capping pulps; second, root-filling material; and third, pyorrhea. If you are ever a member of an essay committee, never despair of being able to

obtain papers if you are willing to accept them on the above subjects. Last fall we had read before the Northeastern Society in this city a most able paper on a plea for the scientific in dentistry. Dr. Kirk made some telling points against our attitude in general respecting the scientific. If you will cogitate on that paper, you will be able to frame a reason for so many papers on the three subjects mentioned. It is my belief that to be scientific in this matter we must divide our cases into two classes: First, the cases where the pericemental tissues are in a normal and healthy condition; second, when they are in an abnormal or unhealthy condition. How many essayists recognize these conditions and then give us accordingly a true treatment and a true filling material? In medicine there are such things as prescriptions, and sometimes there are so many drugs of an allied nature put into one that it is known as a "shotgun" prescription. It is unnecessary for me to tell you why this name has come forth. It, however, may be necessary to state that many times these prescriptions make what the scientific call an "incompatible" prescription. As your chemistry has taught you what the word incompatible means, it is not necessary for me to give you the definition. Again I say it is not alone the instrumentation or the material, but also the educated mind which comes from an understanding of the scientific.

On motion Dr. DeWitt's paper was passed, and the society next listened to a paper from Dr. FREEMAN ALLEN, Boston, on "Recent Methods in the Administration of Anesthetics." (Published in full at page 737 of the September issue of the COSMOS.)

Discussion.

Dr. M. F. ROGERS, Boston. I would like to commence the discussion with ethyl chlorid. Of course we all know and appreciate the work of Dr. Allen, and understand how thorough his knowledge of anesthetics is. During the last three years I have had some practical experience with his apparatus. He says he has kept records of sixty cases of anesthesia

with ethyl chlorid. In my own case I have kept account of only fifteen cases. I have only used it in slight operations, and my experience with this anesthetic in slight operations is that it does not excite any fear on the part of the patient. I have used the Ash apparatus. I simply spray on the mask three or four cubic centimeters and place it over the mouth, and in fifteen cases recorded I have had no trouble whatever. In one case I did have slight nausea, which was very easily checked. In every case the anesthesia was ideal. For the extraction of one or two teeth ethyl chlorid is the ideal anesthetic. A great many think that gas is safer, but I think that is because the records of ethyl chlorid are limited, and it has not been given a thorough test.

With regard to nitrous oxid Dr. Allen has here three little cylinders of gas, and an apparatus which is manipulated with the foot. A great many dentists do not believe in giving gas without an assistant, while others are compelled to do so. We all know how awkward it is to hold the inhaler in one hand and work the cylinder cock with the other; with this apparatus you manipulate it with the foot and have both hands free. I think the progress in the perfection of apparatus for the administration of anesthesia which has been made in England is due to the fact that the English are not so easily satisfied in this respect; the Englishman wants the best or nothing.

Dr. Allen has demonstrated the working of his apparatus in my office several times. The first time he obtained complete anesthesia in two minutes. The patient was as completely anesthetized as anyone could desire. I think it is a mistake to use ether in minor extractions, as a great many dentists do. I have seen Dr. Allen use almost all the different apparatus for this work, and I have never seen anyone manipulate them so thoroughly as he does. I made an ether inhaler similar to Dr. Fillebrown's pump, and Dr. Allen has since improved it. In mouth operations this inhaler is invaluable where the mouth has to be kept open. I know we all fully appreciate Dr. Allen's work in this line.

Dr. W. H. POTTER, Boston. I understand that Dr. Schleich considers that an anesthetic is most safe when its boiling-point is just above that of the normal temperature of the body, and that it is unsafe if its boiling-point is much below the temperature of the body. Judged by that standard, ethyl chlorid, with a boiling-point of 11° C., would not be considered safe.

Dr. FREEMAN ALLEN. I think Dr. Schleich's idea applies more to chloroform than to anything else. His reasoning is that the more nearly an anesthetic approaches the body temperature the more readily will it be eliminated; consequently the safer it will be. Chloroform lurks down in the lungs, and is very slowly eliminated, but when it is used in mixtures the other ingredients help the elimination of the chloroform.

Dr. W. H. POTTER, Boston. I think his reasoning is that those with a low boiling-point are the most unsafe.

Dr. F. ALLEN. Ethyl chlorid has a low boiling-point; it follows that according to Dr. Schleich—if his reasoning were followed out—it would be unsafe. The great danger from an anesthetic is when it is not rapidly eliminated; therefore, if he does claim that agents with low boiling-points are more dangerous than others, I would say that his reasoning is not borne out by clinical facts in the case of ethyl chlorid.

Dr. W. H. POTTER, Boston. I understand that Dr. Schleich does not feel that ethyl chlorid is especially safe. I have never used ethyl chlorid, but have always regarded it as unsafe, simply from the things I have heard about it.

Dr. N. MORGAN, Springfield. I was very much interested in the paper, and in passing I would like to speak of one point, that is, the influence of the operator's mind over that of the patient. Just to illustrate: I had a case of a lady who was to take ether for the extraction of several teeth, and after taking a few breaths of the ether, and just before passing into unconsciousness, she seemed to be very much frightened. I could see very plainly that she was alarmed, and I began to talk to her, assuring her

that I would take care of her, and in a very short time she passed under the influence of the anesthetic. When she came to, she told me that she was in perfect terror until I began talking to her, but my assurances seemed to put her at rest immediately. It seems to me that this has almost as much influence on the patient as has the drug itself.

Dr. F. ALLEN. I agree with Dr. Morgan that the influence of the mind has a very great deal to do with the success of the anesthetic. In giving anesthetics of any kind, if you feel that patients have not confidence in you, you must do something to give them confidence. Impress upon them that you know your business, and try to reassure them. There is no question that excitement and fright have a great deal to do with spoiling a successful administration; they are the principal things that I am striving to avoid, and this I am trying to impress upon the nurses and students with whom I come in contact.

On motion the subject was passed, and the meeting adjourned until 7.30 P.M.

FIRST DAY—*Evening Session.*

The second session was called to order at 8 o'clock by the president, Dr. W. H. Cooke.

Dr. NORMAN G. REOCH, Boston, read a paper on "The Fundamental Principle of Orthodontia." (Printed in full at page 910 of the present issue of the COSMOS.)

Discussion.

Dr. A. P. ROGERS, Fall River. There are some very interesting things in this paper that should be discussed. In the first place, I was glad to see Dr. Reoch bring out so beautifully the normal occlusion of the teeth. To think that dentists sometimes destroy that beautiful work of nature seems beyond comprehension; but my own mouth is an example of such work. When a boy, several of my teeth were extracted to correct an irregularity. Dr. Reoch spoke of the lower cusps in some cases impinging upon the gums; that is the case in my own mouth. When

I was very young three molars, a lateral, and a bicuspid were extracted from my mouth, and the result is that the size of my arches has so diminished that there is scarcely room for the tongue, and talking becomes a considerable difficulty. Another case of this kind that I recall is that of a beautiful young girl, whose first molars were extracted at the age of twelve. A little later the second molars erupted, and as a consequence of the extraction of these first molars there was a distal movement of the lower arch. If the first molars had been left in their normal positions the lower arch would have remained normal, and the facial lines would have been harmonious. We are convinced, most of us, that even when the first molar is badly decayed, we should make strong efforts to save it.

One point more. Most dentists, in attempting to regulate teeth, confine their efforts mostly to one arch, and that one is usually the upper. Dr. Reoch mentioned the fact that the lower arch is of the greatest importance in correcting irregularities, and I wish to emphasize what he says. When we undertake any case of malocclusion for correction, if we but consider the requirements of both arches we shall find that the lower arch must be dwelt with first and foremost.

Another thing I would like to speak of, and that is the proper reproduction in plaster of models of mouths. We have very frequently found in many laboratories models with only about a dozen teeth shown on them. Now, I believe that perfect models go a long way in the practice of orthodontia, as they enable us to study the cases intelligently. I think that any man who is careless in making models of the mouth will be careless in his other affairs. I wish to compliment Dr. Reoch on the many beautiful models that he has shown us, and I hope the importance of this will so impress itself on the profession that the models we see hereafter may be true reproductions of the conditions in the mouth.

Dr. N. MORGAN, Springfield. There are some phases of this question that have not been touched upon, but that it

seems to me would be well to consider. One is that of the nervous and physical strain on the patients during this process of correcting irregularities. The pain and nervous strain on a patient undergoing correction of an irregularity which takes two months, six months, or three years is very severe, and should be taken into consideration. I know that all who have worn separating wedges are prepared to appreciate the feeling, and know something of the punishment inflicted. Just imagine, then, what it is when the teeth are kept in this condition for many months. The pain is intense, and we do not hear more about it simply because the children get tired of complaining, and take this as a matter of necessity, merely accepting the treatment as unavoidable. But there is nevertheless a very severe strain. Several years ago, a young lady in Springfield had her teeth straightened, the process lasting from one to two years. The patient soon after died. I forget what they said caused her death, but her physician was confident that it was indirectly, if not directly, due to the work done in her mouth. Of course that was an extreme case, but it simply illustrates what might result.

Another phase of the question I think should be considered, that which we have seen on the screen, illustrating a case where the teeth were extracted as apparently the best thing that could be done under the circumstances. Many of those cases that are criticized for the extraction of the first molars and the bicuspid are cases where the teeth were on the road to ruin from decay, and the patients, if not absolutely poor, were in straightened circumstances. The operator not being able to treat the cases as he thought best, has done the best he could under the circumstances and extracted the teeth, in the majority of cases improving the conditions. A number of years ago we had Dr. Riggs with us, advocating the extraction of the first molars. I was a young dentist at the time, well acquainted with and a great admirer of Dr. Riggs, and for some time I did more or less extracting of the first molars, hoping to help the cases in the future. Of late

years I have not come in contact with so many children in my practice and have not taken as much interest in this part of our work. But the patients for whom I did extract in those years—say twenty-five years ago—I see more or less of today. I recently took impressions of two of these cases, and I thought yesterday that I would bring them with me; I regret that I have not done so. Although the cases are not absolutely perfect from a physiological standpoint, there being more or less of an end-to-end bite instead of interlocking of the cusps as should be the case, yet the arches and features in both cases are exceedingly good, and considering the condition that the teeth were in when these molars were extracted, I think the results very gratifying. One of the cases was that of a boy from a family in which no care whatever was taken of the teeth, yet today, in spite of that, the man's teeth are quite good. Could you see the other case, where these first molars were taken out, you would say that he had about as good teeth and just as strong a face today as you could find. There is only one trouble, and that is a little tendency toward the end-to-end bite. And so I say, gentlemen, in considering these cases we must consider all sides of the question. I do not think any of us care to do the missionary work required to correct some of these cases, where we would get nothing for it; and even if willing, we might lack judgment in so doing.

Dr. ROBERT T. MOFFATT, Boston. In speaking of the remarks of the gentleman who referred to the necessity of taking into consideration the shock and nervous strain, it is undoubtedly true that this must be considered, but in looking back over the number of cases of this kind that I have handled, I think the majority of the children rather enjoyed the work, and seemed to take quite an interest in it, watching the progress of the case, etc. If there is any special amount of pain in these cases I think it is the fault of the operator. There is either

something wrong with the application of the appliance, it possibly not being properly adjusted, or the teeth are being moved too rapidly. I think the majority of cases can be treated without any special amount of pain. The old method of moving a tooth rapidly, then allowing it to go back a little, then moving it again, was very painful indeed, but under the present methods, where the pressure is made continuously, and firmly yet gently, there should be no pain—nothing more than a slight soreness.

Dr. HORACE L. HOWE, Boston. With regard to Dr. Morgan's remarks as to correcting cases of distal occlusion by extracting, it seems to me that these cases are corrected easier without extraction than with. It is much easier for the patient, and much easier for the operator, and I am sure that the results are more permanent.

I think that the advancement in orthodontia—and I am sure that all will admit that there has been an advancement during the last ten years—is due to the better appreciation of the value of each individual tooth to the form and usefulness of the dental arch as a whole.

Dr. REOCH (closing discussion). The time is so short, I only wish to second Dr. Moffatt's remarks as regards the nervous strain. In cases properly conducted there is little or no such strain. I also have repeatedly seen children improve in this respect as treatment progresses. They come to the chair without dread or fear.

One of the gentlemen, in discussing the paper, spoke of the necessity of extracting teeth when they have become extremely carious. This doubtless is often necessary, and the only form of procedure left in many instances. But the space of such a tooth extracted should be religiously preserved, to be afterward filled in with some form of substitute.

I wish to thank all the speakers for their remarks on the paper, and the society for the honor of appearing before them.

(To be continued.)

THE DENTAL COSMOS

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Devoted to the Interests of the Profession.

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PHILADELPHIA, NOVEMBER 1904.

EDITORIAL DEPARTMENT.

CONFERENCE — ORGANIZATION — CO-OPERATION.

WE republish herewith an editorial which appears in the *Commonwealth Dental Review*, of Sydney, Australia, in its issue for August 10, 1904, because it is a setting forth of the policy of co-operative effort in dental affairs, lucid and to the point, which is well worthy of careful study. The editorial aptly uses the British Medical Association, with its central body and segmentary affiliated associations, as an illustration of professional organization for effective work, and we are of the opinion that precisely similar conditions may be brought about, and should be brought about, in the organization of dental professional work upon a scale of international extent.

It must be evident to all who keep in touch with the output of published professional work from year to year that there is a vast amount of repetition of ideas in all directions. Formal essays too often contain a minimum of originality and a surplus of chaff in the form of old thoughts re-expressed, and the same defect is manifest in the reports of society discussions. Again, a wave of discovery occasionally passes over the general dental mind with the result that a large grist of communications burdens the pages of dental periodicals, and the patience of their readers as well, because simply setting forth the same facts qualified by the views of the several writers who have been inspired to record their personal observations. It is of course true that all these records of the several angles of view are valuable and necessary, for out of the multi-

tude of counsel we may hope for knowledge to issue; but the process under normal conditions is wearisome, and so frequently overtakes the patience of the average thinker or reader that he is often discouraged in his search for the grain of truth hidden in the excess of chaff. A proper organization for the purpose of systematically digesting the relatively crude results of the first output would be of material advantage in more rapidly and certainly sifting the truth from the error than is possible by the present time-consuming and unsystematic methods.

The editor whose communication we here republish truly says, "Dentistry as a standardized profession has lived but a day in the ages of scientific progression; behind it are the first steps—valuable, no doubt, and we are rightly grateful for them; but ahead there lies the field of limitless discovery and advancement." Or, as a well-known teacher once expressed the same idea, "We have only scratched the surface of the field of dental possibilities—a field now ripe for serious scientific cultivation." The possibilities are infinite; let him who doubts it apply to the proposition Lord Kelvin's test for the comprehension of the infinite by contemplating its negation—that is to say, by considering in connection with the present case the extent of things about dentistry which we do not know—and the conception of their infinity is not so difficult.

It is the problem of the present, and it will be increasingly the problem of the future, to search out the causes of the phenomena with which we have to deal, and by so doing to establish our procedures upon a scientific basis instead of the basis of pure empiricism upon which so much of our present practice rests. The effort is now apparent everywhere to achieve the result referred to. The demand of all thinking men is for more knowledge of "the reason why"—the causes of phenomena—so that they may intelligently apply that knowledge to the ends of practice. Much has already been accomplished, and in proportion as individuals have met this demand by observation, research, and study, so has a grateful profession honored them and called them great. But the supply is not equal to the demand; perhaps it never can be, but the stimulus which the demand creates brings out much that has the semblance of worth about it, but which fails to respond to the test of time and practical experience. As a consequence some means is needed to not only improve the general character of the output, but especially is it desirable to digest and sift out the good from the worthless, and place that which is worthy to be preserved in a form useful and accessible to the whole dental profession.

Our Australian colleague says, "The key to the position is found in the word *conference*." True, but the avenue which the key opens is the avenue of organization—not in its limited and local sense, but in an international and universal sense.

The "segmentary" units of such a universal dental organization already exist (and right here let us thank our colleague for that most appropriate word, *segmentary*, in this connection) as local, county, state, and national dental societies, with the international dental congress as the concrete expression of the broader and world relationships of our calling. The links are already forged; it is the problem of organization to unite them into a chain which shall operate powerfully for the advancement of dentistry in all of its departments and as a whole.

The first steps in establishing this bond of universal union have already been taken by the creation of the International Dental Federation, and the keynote of its existence is found in the word "conference." We do not propose at this time to dwell upon the plan of its organization, but rather to indicate one of the important ends which the organization is intended to subserve. It is an end which this article set forth in the beginning, namely, the systematic digestion of the world's work in dentistry and the preservation and presentation of the desirable residuum for general professional use in practice. The Federation has already established several commissions dealing with certain well-established and important departments of dental activity. These commissions are composed of specialists in all parts of the world, and their work is embodied in digested reports which are presented and discussed at the annual meetings of the F. D. I. Each annual report is augmented by the work of the succeeding year, and the accumulated and digested data thus gathered are submitted in the form of a final report at the following international congress as a part of the section work in the section to which the particular report would naturally belong. Where the report embodies matter which it is desirable should be universally adopted as a mode of procedure, it may then be submitted to the congress at large for consideration and final action.

The application of this organized plan to the question of nomenclature will serve to elucidate its value as a means for systematizing and standardizing that inchoate department. The commission of the F. D. I. on Nomenclature would be a continuing body engaged in the collection and systematizing of data pertaining to that subject, and composed of members who are specialists in that department or who are especially interested therein. Its membership would be international in scope, and accessible for any worker in that subject in any country of the world. The study which a commission so constituted would bring to bear upon dental nomenclature, and the progressive digestion and correction of its work from year to year, must result in a report to the next succeeding international congress that would meet with general approval and be worthy of general adoption. As compared with the present unorganized method of procedure the advantages are obvious, and only by such a method is a correct and authoritative result possible.

The plan as here outlined for the study of nomenclature is equally applicable to questions of education, legislation, and in fact to all branches of dental activity. In addition to which, the much-to-be-desired end of international comity in the interchange of scientific results may be achieved and the general standards of dental attainment be raised to a higher plane.

Following is the editorial to which we have referred:

THE FOURTH INTERNATIONAL DENTAL CONGRESS.

THE progressive march of nations rests upon the accumulation of universal knowledge, and its wise application to internal order. In this nervous, restless age, neither nation nor individual may stand still; there must be either progression or retrogression, for the law of competition is inexorable in its demands. In science, in commerce, in politics the same law holds good. Even to religion, stagnation is abhorrent; the wars and disagreements of the various sects have their assigned mission in escaping the danger of the dead level, much as the ceaseless motion of the waves causes the ocean's healthy state. Ancient and contemporary history teem with proofs that commerce and science alike are puny and insignificant till they burst the bounds of self-containment, and go abroad for mental interchange. The modern world has accepted the truth, till today the power born of knowledge has spread, and ever grows apace.

The science of medicine and its far-reaching auxiliaries—dental science among them—were once hide-bound with a conservatism which kept its practical application in the comparative density of ignorance. Thus we perceive what a mighty stride in the onward march of progress this international congress makes. The once closed doors are now wide-flung portals with welcome to the world writ boldly on the threshold. Those who have studied the history of dentistry must pause bewildered before a contemplation of its phenomenal advance. The student of today accepts the conditions as he finds them, not pausing to remember that only a comparatively few years ago the profession, now so manifold in its complexity, profound in its knowledge, and searching in its ramifications, was but a poor thing of crudities and experiments. But the master knows how modern is its development, and, if he be reflective, comprehends how the laboratories of the world have been laid under contribution to perfect the mass of special knowledge which gives him his professional power. For years the collection of the best items of dental knowledge proceeded unconsciously, almost without system or direct design. It was to a certain extent satisfactory, because no better scheme was conceived. But as the profession advanced, every new discovery created a desire for more. Then practical minds set to work to systematize the world's researches, or rather to systematize the methods of research and the exchange and dissemination of the results. The key to the position was found in the word conference.

The aggregation in one place of students and professors fostered not only a useful and valuable interchange of ideas, but promoted an equally valuable rivalry in the field of discovery and research. In the parent department of medicine, communities profited for many years by periodical conferences, and at length, in 1889, the dentists held the First International Dental Congress at Paris, which made possible a universal dental professional brotherhood, the beneficial effects of which were at once apparent. It gave the dentists of the world that opportunity for the intercommunication of ideas which its

unqualified success proved the need of. It was the first step in a movement which has grown with the years. The Second International Dental Congress was held in Chicago in 1893, and the Third Congress was held again in Paris in 1900. Each excelled its predecessor in the material brought forward and the advance made, until now in St. Louis, 1904, we have the most stupendous gathering of dental learning that has yet been brought together. A glance at the marvelous organization and of the world-known names on the various committees assure us of its success.

The advantages of such a comprehensive convention are inestimable, and the profession and people stand today more deeply indebted to American courage and initiative than can be readily conceived. Dentistry as a standardized profession has lived but a day in the ages of scientific progression; behind it are the first steps—valuable, no doubt, and we are rightly grateful for them—but ahead there lies the field of limitless discovery and advancement. That future the International Dental Congress will enable us to systematically prospect—and when our American cousins apply themselves to forward any distinctive movement they do so with no niggard steps. America is the land of mighty action and of mightier prospect, and its actuating motto is “Ever greater.”

A study of the details of this Congress, which sits from August 29 to September 3, discloses a prize achievement in dimensions. The preparations are on a scale approximating grandeur, and the delegates whose good fortune it will be to give personal attendance should form the memories of a lifetime. We were able in our last issue to publish some of the chief details of the giant scheme, but even they could convey but a dim idea of the fulness and completeness of the conception. The previous assemblies appealed to their visitors as stupendous, but now the American members of the dental profession feel that pride should prompt them to “*make the meeting one of great magnitude and far excel its predecessors.*” The keynote to the value of the whole proceeding is exquisitely struck in the following official sentence: “*This Congress should be of great interest to all the profession. There is planned a monster clinic from the best clinicians of the world, scientific papers from the pens of the most noted and scholarly men of the profession, and an exhibit to excel all others.*” The full import of that announcement is not disclosed upon its face. There must be involved in that exchange of practice and theory actual lessons for dentists, and the inspiration for discovery to those whose temperament inclines them to delve for new knowledge. The International Dental Congress will become each time more and more the nursery of inventive thought and application, the granary of the dental world. But added to all this estimation of practical results and transcending them is that immeasurable scope for good that is but ill-defined by the terms sympathy and brotherhood, but is perhaps better implied in the word RECIPROCITY. Periodical assemblage of the dentists of the world means the rapid obliteration of parochial lines and the broadening and liberalizing of the professional intellect. They will teach the lesson that wide as is the world, there is a mental brotherhood which spans it, or, unless it does, must suffer. No man can adequately conceive, much less measure by any of the known rules, the expansive merits of a comprehensive congress in any field of applied science.

The whole argument in commendation of the great International Dental Congress is equally applicable when directed to espouse the establishment of territorial functions with similar aims. They would not supersede the greater event, but would be its complement, and the difference in the advantages would be a mere difference of degree. The Americans know such

meetings as local, state, and national congresses, and it is to them in the absence of more imposing and effective gatherings that much of the progress of dentistry in the United States of America is due. If we Australians could inaugurate such a congress it would be of vast assistance in promoting the cause of the profession, and would, we believe, effectually break down the present interstate restrictions, and bring about a fraternal reciprocal arrangement which every liberal-minded dentist who has faith in his own professional standing must desire. For the advantages accruing we need go no farther than the British Medical Association. That body holds periodical congresses and its segmentary branches in other parts of the world conduct their regular conventions. These lesser gatherings accomplish a mass of detail work and constantly strive for the promotion of uniformity, the improvement or maintenance of the professional status, and the faculty of research. The members of the association are thus better prepared to enter into the larger counsels of the International Congress, and so is established a continuity of excellent effort whose distinct benefit is known in the professional ranks, and acknowledged with gratitude far outside them. When we in Australia contemplate that vast body of dentists assembling in St. Louis, and note the elaborate preparations that have been made for their instruction and comfort, even to the official list of hotels and charges, which appear on another page, we may dwell on the manifestation of healthy brotherhood and community of interests which the gathering implies; we must also be painfully struck by the narrowness of the lines in which we move. Some, indeed, may be appalled at the sacrifice of those skilled delegates in freely giving their best and latest knowledge to others and commingling in person and in spirit. Yet, after all, is there any sacrifice? Is there not rather a gain all round? There can be no gain in the profession that all may not profit by who choose to do so. The day when the possessor of some great method shall hide it, we hope, is forever past.

Our failing in Australia in the past—unfortunately, it is the clog on the wheels of our progress at present—is very largely the element of provincialism. There are in Australia several thousand dentists cut off in sections by geographical lines of demarkation. It is an arbitrary set of conditions to the breaking down of which our earnest efforts should be directed. There is so much harm to attend the maintenance of such separateness and so much good to follow from supplanting it, that there would seem no place for argument. Australia has no cause to be ashamed of the quality of its dentists, nor of the caliber of the ethical members of the profession. But there is wide scope for advancement, and toward that the first step must be systematization.

The Australian Commonwealth is a self-contained nation, new and ready for progress, and in the Fourth International Dental Congress now gathering at St. Louis there is presented to our profession a striking opportunity to accept and adopt the splendid example which America sets us. While our efforts would necessarily have their modest limitations, we could yet organize a Congress, whereat some of the best practitioners abroad might be induced to attend; and in improving our position at home, it would set the seal of recognition among the dental fraternity abroad.—*Commonwealth Dental Review*, Sydney, August 10, 1904.

THE FIFTEENTH INTERNATIONAL CONGRESS OF MEDICINE.

WE are in receipt of the official announcement and inscription blanks of the Fifteenth International Congress of Medicine, to convene in Lisbon, Portugal, April 19 to 26, 1906. The organization appears to be largely perfected, and the seventeen sections of which the congress is to be composed present a formidable array of subjects which would seem to cover the whole field of medical activity. We note with surprise, however, that Stomatology and Odontology, which were given a full sectional division at the previous congress in Madrid, are now represented by the single designation of Stomatology, which is made a subdivision of Section XII, dealing collectively with Laryngology, Otology, and Stomatology.

The organizers of the Lisbon Congress ought to know that any proper and adequate representation of dental and oral science under such a sectional arrangement as they have provided is impossible, and that the relegation of this department to such a minor and insignificant position will not meet with either the approval or support of the very class of men who are able to make that part of the section work a success and a credit to the congress. It has been generally conceded that the work of Section XII, Odontology and Stomatology, of the Madrid Congress was its most prominent feature, and that without it the congress would have been far less of a success than it was.

Further, as odontology and stomatology have had a full sectional representation in previous medical congresses, thereby clearly establishing a precedent which is entitled to respectful consideration, we are of opinion that some satisfactory explanation by the committee of organization is now in order as to why they have reduced these important branches of the science and art of healing to an inferior and subordinate position.

BIBLIOGRAPHICAL.

A TEXT-BOOK OF DENTAL PATHOLOGY AND THERAPEUTICS, FOR STUDENTS AND PRACTITIONERS. By HENRY H. BURCHARD, M.D., D.D.S., late Special Lecturer on Dental Pathology and Therapeutics in the Philadelphia Dental College. Revised by OTTO E. INGLIS, D.D.S., Professor of Dental Pathology and Therapeutics in the Philadelphia Dental College. Second Edition. Illustrated with 545 engravings and a colored plate. Philadelphia and New York: Lea Brothers & Co., 1904.

We have been waiting with anticipations of satisfaction for the appearance of this revision, and the result is not disappointing. In our opinion no work on dental pathology had appeared until the publication of Burchard's book which adequately treated the subject. It was scientific in character and philosophical in method, and its teaching quality was of a superior order of merit. Indeed, anything which emanated from the pen of its distinguished author necessarily possessed those qualities, for they characterized his mode of thinking.

Whatever of criticism we should be inclined to make upon the original work would relate principally to the author's style, which was often ponderous and sometimes involved to a degree that rendered his writing difficult of comprehension by the undergraduate student. In his communications to a professional audience the quality referred to was not so noticeable, but in a work primarily intended as a text-book for students greater

simplicity and plainness of diction is a necessity.

The present revision by Dr. Inglis has largely removed the foregoing source of criticism, and he has besides brought the record of the science itself down to date, making a work which must inevitably remain as the standard text-book on the subject, at least until superseded by an improved treatise.

There are some features of the revision with which we are not altogether in accord, as for example the introductory exposition of "General Principles" has, we think, been too much condensed, and certain valuable considerations in that chapter in the previous edition have been omitted, to the disadvantage, we consider, of the teaching value of the book.

The chapter, or rather section, on Immunity is too meager. The subject is becoming of more and more importance in dental pathological work, and should have been more fully elaborated, especially with respect to its fundamental principles.

The derivation of the word diagnosis from *dia*, a part, and *gnosis*, knowledge, is incorrect; the derivation was correctly given as it appeared in the original edition.

The reviser's definition of disturbances of nutrition, Chapter IV, we regard as faulty. It is as follows: "Disorders of nutrition are of three classes: (1) Due to an excess of nutritive material; (2) due to deficiency of nutritive material; (3) due to the presence in the blood of material which, instead of serving the

purpose of metabolism, disturbs it." We hold that it is not deficiency or excess of nutritive material that is the basal factor in malnutrition, but rather a fault in the metabolic processes which results among other things in hyper- or hypnutrition quite apart from the quantity of nutritive material available. This fundamental principle is clearly set forth in Burchard's first edition, and its operation beautifully illustrated in a diagram on page 51—a diagram which is of such important teaching value that we regret to note its omission in the revised second edition.

Some other minor features we should be inclined to take exception to, as for example the suggestion (page 160) that certain observed differences in structure of the dentin under polarized light may be "possible alterations as the result of sclerotic change."

The class of cases of pathological dentition in which the local symptoms are other than those indicative of a hyperemic gum tissue, but, on the contrary, an ischemia with tense glistening mucous membrane, should be more fully and emphatically treated, as it is this class of cases particularly that develops profound reflex nervous phenomena of a serious character, and that are most promptly and radically relieved by the intelligent use of the lancet.

We should have been glad to find a full treatment of the subject of reflex disturbances originating in difficult or impeded eruption of the permanent teeth. As these are well-known pathological conditions the obscure etiology of which often leads to a wrong diagnosis by the

nerve specialist they should be fully considered in a work of this character.

We have been unable to find any reference to leukoplakia buccalis, and only a general reference to epithelioma. Similarly all consideration of the buccal manifestations of lead poisoning is omitted. The well-known effects of the metallic poisons referred to should, we think, have been given full consideration—especially the rôle of mercury in causing stomatitis as shown by the exhaustive and conclusive studies by Professor Loup, reported at the Paris Dental Congress of 1900.*

We see little or no justification for the extensive treatment which has been given to the embryology, anatomy, and histology of the dental structures in a book on pathology and therapeutics. While it is skilfully done, it is a department which does not strictly belong in a work of this kind, and should be separately published.

We approve of the omission of the chapter on Pharmacology, and of the careful revision which has been given to the chapters on Erosion and Dental Caries, and the many other minor additions which enhance the general excellence of the work.

We commend this book as the best of its kind within our knowledge notwithstanding the points of criticism referred to. The revision has upon the whole been well done, and inasmuch as it has been brought up to the existing state of our knowledge in this department the second edition is an improvement upon its predecessor.

* See Cosmos, 1900, vol. xlii, p. 1300.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Wiener med. Wochenschrift*, July 1904.]

TREATMENT OF MERCURIAL STOMATITIS. BY DR. OPPENHEIM.

Dr. Oppenheim advocates the use of hydrogen dioxid solutions for the treatment of infectious stomatitis indirectly chargeable to the injection of large doses of mercury. He applies upon the ulcerated patches thirty per cent. hydrogen dioxid. The patient is directed to use gargles of three per cent. hydrogen dioxid. It has been his experience that after two days of this kind of treatment salivation and fetidity of the breath disappear, and the ulcerations begin to subside.

[*British Dental Journal*, London, September 1904.]

A CASE OF FIBROUS POLYPUS IN THE HARD PALATE. BY C. HAMILTON WHITEFORD.

The author reports a case of a patient, a woman aged thirty-two, affected with a smooth circular tumor, the size of a sixpenny piece and half an inch in thickness, upon the right side of the hard palate, to which it was attached by a short pedicle one-sixth inch in thickness and one-fourth inch in length. The attachment was opposite the lateral incisor. The circular form of the growth was due to the suction depression in the tooth-plate. Under ethyl chlorid and ether the growth was removed by dividing the pedicle, after which many carious teeth were removed by a dental surgeon. Two smaller growths the size of split peas were also removed, and several minute growths were noticed scattered over the hard palate. All the growths appeared vascular prior to the application of adrenalin chlorid 1 to 1000, as a result of which the hemorrhage from the palate and gum was very slight. The clinical microscopic examination showed that the tumor was a simple fibrous polypus of the palate consisting of wavy fibrous tissue covered with squamous epithelium, and was not of the malignant type. Mr. Bland Sutton is of the opinion that such growths are frequently due to irritation caused by plates.

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[*Bulletin Thérapeutique*, Paris, August 1904.]

TREATMENT OF THRUSH. (EDITORIAL.)

The following treatment is here recommended: Touch the affected parts three times a day with the following application:

Sodium bicarbonate,	4 gm.
Sodium bromate,	2 "
Syrup of mulberry,	20 "

Or,

Pure glycerin,	20 gm.
Starch,	4 "
Pulverized sodium bromate,	4 "

[*Klinische Wochenschrift*, Berlin, June 1904.]

A CASE OF BLENNORRHAGIC STOMATITIS IN AN ADULT. BY DR. JURGENS.

The case observed by Dr. Jurgens was that of a man suffering from specific urethritis, in whom developed shortly after the onset of the attack symptoms of ulcero-membranous stomatitis of most serious intensity. The red and softened oral mucous membrane was so swollen that the patient could open the mouth with difficulty only, the mandibular movements being attended by excruciating pain. The gingival tissues were the field of acute and deep-seated inflammation, and were covered with a greenish gray and fetid deposit. The infection subsided after the use of mercury bichlorid solution. The bacteriologic examination revealed the presence of a great number of fusiform bacilli and spirillæ, and a few rare diplococci justifying the diagnosis of the gonococic nature of the stomatitis. Bleorrhagic stomatitis, which is at times met with in the case of the newborn, is exceptional in the adult.

[*La Stomatologia*, Milan, August 1904.]

TREATMENT OF SENSITIVE DENTIN. (EDITORIAL.)

After referring to the methods advocated from time to time for the treatment of sensitive dentin, the editor states that the use of water of a high temperature has given satisfactory results in the treatment of hypersensitivity of the dentin. With the aid of a stream

of warm water it is possible to file teeth and to adjust artificial crowns and bridges without causing any undue degree of pain. An apparatus has been devised by means of which it is possible to direct a stream of hot water from the end of a rubber tube attached to the extremity of the instrument in use. The small rubber tube communicates with a cylinder within a receptacle containing boiling water. A valvular arrangement permits the graduation of the temperature of the water as the case may require. Other apparatus have been constructed in which the water is heated by means of electricity. When using the hot-water method it is always advisable to operate in conjunction with a saliva ejector. It is of course understood that the stream that is first applied is not of the extremely high temperature, as such a condition would be painful, to say the least. The temperature of the water is gradually increased until the desired heat is obtained. The pain in the dentin is not always entirely eradicated, but it is so decreased that it becomes perfectly bearable.

The satisfactory results obtained with the method under discussion are not due to any mental suggestion, as was proved by the case of a dentist who was being treated by this method blindfolded; as soon as the current of hot water was cut off the pain reappeared.

[*British Dental Journal*, London, September 1904.]

VULCANITE CROWNS. By E. R. TEBBITT.

The vulcanite crown has proved of service, first for "trial crowns" where the root does not, in spite of all efforts, seem to arrive at an entirely satisfactory condition, and leaves one in doubt as to the ultimate result if crowned and required to take its share in the daily grind. After treating the root as much as is possible, it is fitted with a vulcanite crown, and if the tooth is allowed to remain passive for a few months it is more than probable that it will then stand the jar of the gold or porcelain substitute. On the other hand, if the root revolts under the comparatively soft bite of the vulcanite crown, it is extremely unlikely that it would tolerate the harsher impact from the harder substitutes.

Again, there are frequently cases of children between six and fourteen whose first permanent molars it is desirable to keep so as to maintain the integrity of the arch and to prevent the "squashing down" of the bite. These much-discussed teeth, especially the lower ones, are often quickly and easily re-

stored to usefulness by adaptation of the vulcanite crown, by a process not trying to patient or operator, and the result is sufficiently permanent for the end in view. Crowning a root which is not fully formed seems wrong, but with ordinary care and a short pin it can be done, and the root certainly improves in general health, while it has its reasonable share of work to do.

After preparing the root-canals in the way which is to each operator the best, clean out the exposed surface of the root with the largest and coarsest-cut burs that can be used. If there be gum overhanging, it is cleared out by means of gutta-percha allowed to remain in place a few days. A gold pin is then fitted into one canal and an impression taken, the projecting portion of the pin having been previously well flattened. At the same sitting an impression is taken of the opposite teeth. Both these impressions are cast in Spence metal and mounted in an articulator. The pin is then removed and the root and surrounding gum anointed with any oily liquid. Replace the pin, drop melted wax around it just to cover the root, and at this stage a porcelain facing is to be used. It should be fitted. Continue to build the crown up to the bite with wax, trimming the edges so as to be sure that no part of the wax overlaps the gum. The whole crown is now removed from the model and flaked, the lingual aspect being the only one exposed. This insures the correct bite and an undisturbed fit. As the elasticity of the rubber is in this case of no consequence, it would be just as well to vulcanize it for two hours, although an ordinary bake-plate will answer. Where the best masticating apparatus is desired a platinum pin may be used, and, having spread the top of it with a riveting hammer, adapt that part to take the brunt of the bite, and the surrounding vulcanite will be a long time before it shows any signs of wear.

[*Dental Era*, St. Louis, Mo., October 1904.]

THE X RAY IN PYORRHEA ALVEOLARIS.

By R. D. SCHMITT.

In treating epithelioma of the lower lip the author's attention was directed to the changes in the mouth brought about by exposure to X ray.

In this particular case the gum of the patient was in bad condition, especially around a lower canine, from the pocket of which pus had been oozing for a long time, as the patient expressed it. This tooth being in the direct line of exposure soon began to improve. It became firmer in its socket, all

soreness disappeared, the gum lost the dark purple color, and the cervical gingival contour regained its normal condition. Suspecting that the X ray might have had something to do with that case, Dr. Schmitt determined to watch the next one closely, and it so happened that the next was a case in which the molars were involved, both upper and lower, the epithelioma being situated on the side of the jaw. The affected teeth were in the direct line of exposure, and began to improve. Today the pockets are closed and the teeth are firm and in all respects perfectly natural. The point of special interest in this case is that the teeth protected from the rays are still in the same pathological state as before the rays were applied.

The author then reports a case of a woman of about forty years of age. Almost every tooth in her mouth was affected by pyorrhea. Pockets had formed on the approximal and lingual surfaces. Her general health was bad, owing doubtless to the toxemia induced by the infectious condition of her mouth. The patient was subjected to the influence of the X ray. After a few weeks the conditions began to improve, pus had almost entirely ceased to flow, the inflammation of the gums subsided, and the teeth became firmer. After continued treatment the pockets have closed up, her general health has improved very much, the treatment giving most satisfactory results both upon the local condition and the general systemic state.

The first steps in this treatment should consist in the removal of all deposits from the teeth. If the gum be tumefied and painful it should be treated until the inflammation subsides at least partially. The affected parts are then exposed to the influence of the X ray, being careful to protect the face of the patient, exposing only those parts which it is desirable to affect.

[*Dental Register*, September 15, 1904.]

MAT GOLD AND HOW TO USE IT. By F. L. YOUNG.

Discussing the methods of introducing crystal gold, the author states that the best results are obtained when the cavities are shaped so that a sufficient degree of pressure may be applied to condense the gold firmly against the tooth walls and cavity margins. After removing all decay and sterilizing the cavity the margins are extended and made true. It is then ready to begin filling. In the case of approximal cavities the margins should be made as nearly as is practicable at right angles to the surfaces of the tooth.

Care should be exercised to properly anneal the gold, not over the flame of a lamp, but by means of one of the various forms of electric annealers or porcelain disks over a Bunsen flame. The gold should be annealed to a low red color in order to make it thoroughly cohesive.

To start the filling it is at times advisable to use a rope of soft gold foil. This rope should be large enough to fill the cervical part of the cavity, and should then be carefully forced to place and condensed. This rope may be made of tin and gold, and Dr. Young finds that by combining these two filling materials the tin is prevented from turning black. Tin and gold together produce a gray color, instead of a black one as is the case when tin alone is used, and furthermore the combination seems harder than when either of these materials is used singly.

After laying into the cavity a sufficient foundation, the rest is packed with any of the several forms of crystal gold, annealing it well and condensing it with finely serrated pluggers of suitable form to carry it into every part of the cavity. In approximal cavities where the use of a matrix is indicated, the cavity is extended laterally as much as is necessary, when the matrix is placed and fastened to the tooth. In this class of cavities an acute angle is formed on the lateral margins by the matrix and lateral walls, into which it is troublesome to get the crystal gold condensed thoroughly. To accomplish this object successfully, after laying in the bottom of the cavity the gold and tin combination, a cylinder of soft gold of the proper length is set up on end in this acute angle, and allowed to remain *in situ* somewhat loosely. The packing of crystal gold is then begun, and, thus carried against this cylinder of foil, it is driven up tightly into the farthest part of the angle. The crystal gold uniting with the cylinder of foil becomes properly condensed, securing a perfect adaptation with the cavity margins—one that will not leak or break away. By using a rotary force the crystal gold is directed into the angle, carrying before it the foil.

The author calls attention to the necessity of restoring occlusal as well as lateral contour. A flat morsal surface is objectionable, not only because it directs the food into approximal spaces, but it interferes with the proper occlusion and becomes the means of causing malocclusion. In small cavities of the incisor teeth there is no need to make extensive undercuts: a small anchorage toward the cervical and another toward the incisal ends of the cavity will be all that

is required. To start a filling, place a piece of gold in each of these undercuts and condense. Then lay in another piece which will extend from one anchorage to the other, and which will cover the lingual wall of the cavity. This will form not only the lingual part of the filling, but will fix the anchorages at the cervical and incisal ends of the cavity. The rest of the filling is then easily completed.

[*Odontologie*, Paris, August 30, 1904.]

ODONTOPATHIC MENTAL FISTULA. READ
BY DR. MESSIAN BEFORE THE SOCIÉTÉ BELGE
DE STOMATOLOGIE.

It is an acknowledged fact that even a slight shock or injury to one or more teeth may result, eventually, in the mortification of the pulp with all its attending evils. The cause of the injury may pass unobserved. A slight shock, the presence of a hard body between the teeth, or gnashing may bring about a pathologic reaction in the tissues of the pulp. The effect of the traumatism varies. In slight cases it manifests itself by hyperesthesia of the pulp or by dull pain, disappearing rapidly, particularly if the affected tooth is maintained in a state of physiologic rest. In more serious cases, the pulp having become detached from the nerve trunk, the dentinal tubuli become infiltrated with coloring matter from the extravasated blood, and eventually acquire a gray or bluish coloration.

In this variety of cases the traumatism has caused the death of the pulp, although the disorder is often unaccompanied by infection. Such is not, however, the case when the pulp becomes the seat of infectious phenomena. Pulpitis and pericementitis soon develop, and all the characteristic symptoms of these disturbances become at once evident. Micro-organisms penetrate the pericementum either through a break in the continuity of the gingivæ around the neck of the tooth, or through a solution of continuity in the enamel—a condition which at once establishes a suitable portal of entry for the parasites of the buccal flora, which are thus enabled to exercise their detrimental action upon both the inorganic and the organic constituents of the dentinal tubuli.

Death of the pulp leads eventually and in a large proportion of cases to pericementitis and alveolar abscess, which will persist as long as the cause is not completely eradicated.

As a rule it is an easy matter to determine the cause of a fistulous opening in the mucous membrane of the mouth; but the same cannot be said of a cutaneous fistula, as here

the focus of origin may be at an extremely remote point. As an instance of this may be mentioned the mental fistula which sometimes occurs in the course of pathologic evolution of the third molar. Professor Tillaux has stated that whenever a fistulous tract develops in the neighborhood of the maxillæ, due attention should be given to the condition of the teeth, as the condition is usually the effect of infectious phenomena within these organs.

The author then reports the case of a woman, aged twenty-six, who from the age of eleven had been suffering from pain in the mental mandibular region. No apparent cause could be discovered, as the teeth were free from dental caries and erosion and the patient did not give any history of either traumatism or infectious disease. In the course of time there developed upon the painful area a hard tumor of pronounced size producing a slight projection of the overlying skin, which soon acquired a reddish violet hue. The physician who was consulted directed the application of poultices upon the mental region. Shortly afterward the skin became of a deeper hue and extremely soft. These emollient applications were continued until the skin became sufficiently soft for incision. The incision produced the flow of a great quantity of pus mixed with blood; the suppuration was treated with antiseptic injections and dressings of iodoform gauze. This treatment was continued for several weeks, but was of no avail in suppressing the purulent condition.

During the next two or three years the patient was subjected to antiseptic treatment of various kinds, but again without permanent result. At this stage in the course of treatment the fistula closed, but only for a short time. Concomitantly with the closing of the mental tract another one developed in the suprahoid region. This latter fistula was surgically treated, and after some time of persistent and careful attention its closure was likewise obtained. Immediately upon the eradication of the suprahoid fistula the mental one reappeared and pus continued to flow.

The condition about the mental region persisted for five or six years more, simply because the attending physicians, surgeons, and dentists had not been able to trace the cause of the disturbance, which eventually was found to be located in a lower central incisor. When the patient was brought to Dr. Messian, he found, after a thorough examination of every tooth in the mouth, that the lower right central incisor was slightly more

opaque than the neighboring organs. This tooth did not respond to either hot or cold applications. It was opened, the contents of the root-canal removed, and antiseptic dressings applied in order to insure the destruction of all pus-producing organisms. Shortly afterward the inflammation about the mandible disappeared, the fistula closed up, and today the patient is again in perfect health.

This case is interesting for various reasons: First, because a cutaneous fistula was present without any sign of dental caries upon the teeth; second, because the death of the pulp of the central incisor was caused by some unknown factor; third, on account of the difficulty of establishing an exact diagnosis; fourth, because of the duration of the disturbance, notwithstanding all the antiseptic measures employed; fifth, because of the disappearance of the mental fistula and the production of a suprahyoid abscess; sixth, because of the chronic nature of the suppuration; and seventh, because of the rapidity of the cure after the discovery and eradication of the real cause.

[*La Odontología*, Madrid, September 1904.]

FEAR AND COCAIN. THÈSE DE PARIS, BY

DR. BOUR.

Dr. Bour has studied the toxic effects of cocain, and records the results of his investigations in his thesis recently published. By comparing the statistics collected by Bour with those of Falk and Delbose published several years ago, it is found that the proportion of fatal cocain poisonings has markedly decreased—a condition which may be attributed to a better understanding of the proper rules of cocain administration.

An interesting point in cocain analgesia is the fact that the post-anesthetic effects vary

in different individuals. Some persons can stand comfortably and without deleterious results large doses of cocain, while in others the smallest possible dose will bring about most alarming results. The reason for this diversity of action has not been as yet satisfactorily explained. Amongst the responsible factors fear must be duly considered, although its significance is as yet far from being fully appreciated. Morro, who has investigated the question, has found that fear of any kind provokes spasmodic vaso-constriction, which in turn causes an anemic state of the peripheral cerebral organs, paralysis of the motor apparatus, and spasmodic contractions of the involuntary muscles. Respiration becomes irregular, the cardiac rhythm increases, the pupil dilates by stimulation of the sympathetic fibers, and lastly paralysis of the voluntary muscles supervenes, often preceded by convulsions.

The physiological effects of fear are analogous to those of cocain, and consequently the logical conclusion that cocain and fear act synergically. In a timid individual dangerous toxic symptoms may follow the use of one-half the quantity of cocain which would be required to produce similar effects in a normal subject. Fear alone may be the cause of serious syncope, as shown in the case of the man who, thinking that cocain was being injected, soon exhibited serious symptoms of intoxication after an injection of ten drops of distilled water. Nervous and excitable patients are more susceptible to the effects of the drug, and therefore it is advisable so far as possible to avoid its use in such patients.

The author recommends the addition of amyl nitrite in order to counteract the powerful vaso-constrictor action of cocain and its salts.

PERISCOPE.

Extracting Frail Roots.—If a frail root be filled with quick-setting cement just before extracting—of course allowing time for the cement to set—the danger of crushing with the forceps is lessened. Care should be taken not to force the cement beyond the apex.—A. M. WAAS, *Dental Review*.

Blistering from Tincture of Iodin.—Claret (*Journal de Médecine interne*) states that the application of starch, or even of ordinary flour, with enough water to make a paste, will, when applied to the injured surface, form starch iodid, which is harmless to the skin.—*New York Med. Journal*.

New Remedies.—Rexotan is a new astringent prepared by Aufrecht by the condensation of tannic acid and urea by means of formic aldehyd. It has the formula $C_{10}H_{12}N_2O_{10}$. Methylene-hippuric acid is a new preparation of hippuric acid formed by the action of a paraformic aldehyd of hippuric acid. It melts at 151° .—*Chemist and Druggist*.

Two Dental Remedies: Trioxymethylene and Formol-Geranium.—*Trioxymethylene*, also known as paraform and triformol, is a polymeric to formaldehyd. It is obtained by heating an aqueous solution of formaldehyd. It comes in the form of a white crystalline powder, insoluble in water. It is used for capping pulps and for filling root-canals, Dr. Pitsch recommending the following formula:

Trioxymethylene,	16 gm.;
Pure vaselin,	8 gm.;
Inert powder,	6 gm.;
Cocain hydrochlorid,	2 gm.

Dr. Robin fills root-canals with the following paste:

Trioxymethylene,	1 gm.;
Zinc oxid,	9 gm.

Formol-Geranium. Dr. André has described the preparation of formol-geranium as follows: 20 c.c. of essence of geranium and roses are dissolved in 35 c.c. of alcohol; 40 c.c. of formalin are then added, and the whole is strongly shaken; then sufficient absolute alcohol to make 100 c.c. is added. To make the solution clearer, it may be filtered through a little magnesium carbonate, which retains the excess of geranium.

Swelling in the Submaxillary Region.—The recurrence of intermittent swelling in the submaxillary region, with or without pain, redness, tenderness, and fever due to suppuration, is very suggestive of the presence of a salivary calculus, usually in the submaxillary duct or gland. If pus can be expressed from the duct the diagnosis is more certain. The stone can usually be palpated, or located by passing into the duct the wire stiletto of an aspirating needle. Submaxillary mumps occurs sufficiently often to be also borne in mind in dealing with swellings in that location.—*Internat. Journ. of Surgery*.

The Doctor and Babylonian Law.—In the writings of Hammurabi of Babylon, 2250 B.C., the following interesting laws are found: "If a physician operates on a man for a severe wound with a bronze lancet and saves the man's life, or if he opens an abscess (in the eye) of a man with a bronze lancet and saves the man's eye, he shall receive ten shekels of silver (as his fee). . . . If a physician operates on a man for a severe wound with a bronze lancet and causes the man's death, or opens an abscess (in the eye) of a man with a bronze lancet and destroys the man's eye, they shall cut off his fingers."—*Health*.

Alcohol Applications.—Kolbassanko (*Therapeutische Monatshefte*, vol. xvii, p. 635) recommends alcohol applications in many surgical diseases. He has seen great benefit from them in simple inflammations, suppuration, and septic conditions, and even upon foci lying at considerable depth. He has been able to prevent many operations by using them alone. Six to eight layers of gauze are saturated with alcohol, varying in strength from fifty-seven to ninety per cent., applied over the diseased area, and covered with a large layer of paraffin paper or oilcloth. The alcohol is renewed as soon as it evaporates. Tender skins are powdered over with xeroform, or covered with an ointment of xeroform, orthoform, lanolin, and vaselin. If the dressing is to be continued some days, the treatment must be interrupted occasionally to permit the skin to recover. The dressing is markedly analgesic, but only while it is moist.—*Therapeutic Gazette*.

Pulp-Capping Material.—A neighboring practitioner who has experimented in the direction of securing a compound that could be easily applied and that would become hard very quickly, told the writer that his best results were obtained by incorporating equal parts of salol and thymol with sufficient commercial zinc oxid to give it body. The salol and thymol were made fluid over a water-bath, and the zinc oxid added and thoroughly incorporated before the mass had time to solidify. A heated burnisher or other instrument applied to the solid mass would fluidify and take up enough of the material to flow over the pulp-exposure and cover it.—S. H. GUILFORD, *Stomatologist*.

Pressure Anesthesia in the Removal of Pulp.—It is very hard to tell where to use this method and where not. To make a general statement, it is indicated where the pulps can be removed entirely by mechanical means, and contraindicated where this cannot be done. I would say that in proportion as the pulps of teeth are difficult to remove, pressure anesthesia is contraindicated. It follows then, that the centrals, laterals, canines, second bicuspid, and frequently the first bicuspid and first molars are best suited for this method, while the second and third molars and occasionally the first bicuspid and first molars can be more successfully treated by devitalizing.—R. A. ADAMS, *Dental Summary*.

A Great Egyptian Physician.—A London physician in a lecture recently declared that the Egyptians nearly 6000 years ago understood the human body very nearly as well as we do today, and traced the descent of medical and anatomical knowledge far beyond Galen and Hippocrates in Greece to the land of the Pharaohs, and especially to Imhotep, a priest of the sun-god Ra and physician to King Tosorthros.

He and his disciples knew much about the heart, and noted its diseases; they had ideas about the circulation of the blood closely paralleling those which Harvey disclosed three hundred years ago; and recommended methods of treatment which are still practiced. So great a teacher and physician was Imhotep that when he died he was revered as a demigod, and a temple was built in his honor. More in the modern style of memorials were hospitals which were built at Memphis and other cities in his honor, where the sick were treated and the dead embalmed. He was probably the first real physician of the world.—*Chicago Medical Times*.

Blue Light for Neuralgia.—Arienzo is cited by the *Journal de Médecine de Paris* as having employed in obstinate cases an ordinary reflector with an incandescent lamp of thirty-candle power, applied for from ten to fifteen minutes, the patient being some fifteen centimeters from the apparatus. Four cases of neuralgia of the trigeminus and one of the auriculo-temporal nerve were speedily jugulated by the treatment. The number of treatments averaged ten, one being administered daily. In one case only was it necessary to continue treatment for twenty days. According to Arienzo, blue rays have a specific anesthetic effect; he thinks the light penetrates the tissues and subjacent organs, and has a special action upon the vasa nervorum.—*New York Med. Journal*.

Tea and Coffee a Cause of Rheumatism.—Dr. J. C. Walton, in an article on the prophylaxis and treatment of uric-acid conditions, published in the *Charlotte Medical Journal* for April 1904, mentions a case of rheumatism in which, notwithstanding rigid diet and thoroughgoing treatment, no improvement was noticeable until after the patient gave up his coffee, when the disease promptly subsided. The writer states that he has observed a number of similar cases. This is quite in accord with Haig's theory that thein or caffeine produces the same pernicious effects in the body that uric acid does. Dr. Walton has observed excellent results from the use of hot air and other sweating procedures, followed by a graduated cold bath.—*Modern Medicine*.

Forcing the Gum from Deep Buccal and Labial Cavities.—When the cavity extends far up under the gum margin the following method renders it a comparatively painless operation. Pass a waxed ligature twice around the tooth containing the cavity. Insert one edge of a large-sized roll of cotton under the ligature, and draw the first lap tight. Press the remainder of the roll against the gum over the cavity, tie the second lap of the ligature over the center of the cotton, and leave for a day or two. When the patient returns it will generally be found that the gum is entirely pressed back from the cavity. Before removing, dry the cotton well, and saturate it with adrenalin chlorid to stop hemorrhage. Dry the cotton again and saturate with cocaine for a few minutes. The cotton can now be removed and the gums painted with collodion to prevent weeping. Use a narrow clamp in such cases.—J. MILLS, *Dental Review*.

Seamless Crowns.—I much prefer to make all crowns seamless, especially those with open face. Swaged over an accurate model of the tooth, they have a glove-like fit which I have been unable to attain by any other method. It is well to remember, however, that drawing a disk of gold plate to the form of a thimble does not increase its toughness, and that a seamless crown so made must be thoroughly reinforced. The narrow bar at the gum margin should be doubled, and any bridge attachment should be so extended as not to depend for security upon a small area of the crown. I find a satisfaction in using seamless crowns for bridge supports in that when fitted there is no risk of the fit being impaired by solder running inside. The method of construction, however, is a mere personal matter, and has but little to do with the result.—WM. H. TRUEMAN, *Dental Brief*.

System in the Management of the Dental Office.—A professional man's time is largely his capital, and this is especially so with the dentist. Having to apportion out our time, as we must for the different operations, the careful arrangement of the work to be taken care of each day is very important, and any measures we can employ to utilize our time in the most profitable manner should be taken advantage of. In fact, I know of nothing more important in the management of a dental practice than the intelligent and careful mapping-out and arrangement of the day's work. In a city practice, with one patient closely following another, two chairs are a great aid in utilization of time, even if they are both in the same room and only separated by a screen, though of course it is better to have the chairs in different rooms. This second operating room is very useful in many ways, and after setting an inlay I frequently leave a patient there for the cement to set, while I start work on the next patient in the other chair. I also use this second room when taking impressions, and instead of waiting while the assistant cleans up the plaster and makes things presentable, I can go right to work at the other chair. It is a good plan to have duplicates of those instruments that are in frequent use, such as mouth-mirrors, explorers, scalers, and some of the excavators. One set is always clean and ready, and when the soiled ones are removed may be brought in ready for use. This saves much time from waiting, and averts the possibility of the assistant not properly cleansing them, as is not unlikely when we are waiting for the instruments to go on with our work.—HENRY C. RAYMOND, *Dental Register*.

Observations on the Therapeutic Value of Radium and Thorium.—MacLeod gives a report (*British Med. Journal*, June 11, 1904) of some cases treated by radium bromid, with apparent success. He finds its chief utility is in the treatment of rodent ulcer, especially when small. When large, treatment by the X rays is more practical, as the whole of the ulcer can be exposed at once and not piecemeal, as must be the case with the small quantities of radium at present at our disposal. In some cases, where the healing process becomes stationary when using the X ray, healing may again be stimulated by exposure to radium. His results in the treatment of epithelioma were disappointing, but not sufficient to base any definite conclusions upon. In lupus vulgaris, radium causes the disappearance of the granuloma, and its replacement by healthy scar tissue. In the verrucose type of lupus vulgaris it is superior to the Finsen light. In lupus erythematosus its value seemed to be slight. It is a useful adjuvant to the Finsen light and X ray, as it can be applied to positions which are difficult to get at. The results of the use of thorium do not appear to be at all encouraging.—*Modern Medicine*.

Bloodless Operations on the Skull under Local Anesthesia.—Heidenhain (*Centralblatt für Chirurgie*, March 5, 1904) has succeeded in producing local anesthesia in several cases in which he has operated on the skull for caries, tumor of the brain, etc. He employs a 0.5 to 1 per cent. solution of cocaine, to each cubic centimeter of which has been added one or two drops of 0.1 solution of adrenalin. One cubic centimeter of this solution injected hypodermically will within half an hour produce complete anesthesia of the skin, subcutaneous tissues, and fascia over an area the size of a silver dollar. By injecting it beneath the occipito-frontalis aponeurosis, the bone and dura mater can also be anesthetized. The anesthesia will persist for hours. In Germany 0.05 gm. is considered the maximum dose of cocaine, but Reclus, with an experience of seven thousand cases, uses as much as 0.20 gm. in dilute solution. When using large doses the patient should not fast, and should partake of a cup of coffee with a little alcohol during the operation, and some thick soup after it. In addition, the patient should be kept in the horizontal position during the operation, and for at least an hour after its completion. The increased tolerance to cocaine when used in this way is caused by the local anemia produced by the adrenalin.—*Therapeutic Gazette*.

The Open-Face Crown.—The open-face crown, as I understand, is adapted only to those teeth which have normally good faces; this naturally confines their use to sound teeth or teeth the labial or buccal surface of which is in a perfect condition. There are many bicuspsids where the palatal half of the crown has been fractured or destroyed by caries, and restoration is necessary. In such cases I think the open-face is the best. As an abutment for large bridges they lack strength, unless the band which covers the cervical portion of the tooth is thick and wide enough to give the desired strength. I find that where the bite is close the strain brought upon an open-face crown under the stress of mastication will force it out of position. From an esthetic point of view the open-face crown is much to be preferred to an all-gold crown, especially for anterior teeth; its usefulness depends on its accurate adaptation. If the band could be strengthened, this crown would be preferred as an anterior abutment for bridges. What to my mind serves a better purpose for anterior abutments for bridges is a plate fitted to the palatal surface of the tooth, and a pin extended well up in the root-canal soldered to it.—G. W. CURRIE, *Dental Brief*.

The Protective Action of Pus.—Binaghi (*Riforma Medica*, May 4, 1904) has carried out a series of experiments *in vitro* and *in vivo* tending to show the bactericidal action of pus upon certain virulent organisms. The method was to induce the formation of an abscess in rabbits, and then inject cultures of various bacilli (anthrax, tetanus, malignant edema, staphylococcus aureus) into the abscess cavity, and watch the effects. Out of fifteen rabbits operated upon in this manner, only two died (from anthrax), and in them the abscess was small and hard, and the injection penetrated the surrounding healthy tissues. The control animals all died. Further experiments showed that pus does not confer a true immunity, but only a relative and temporary immunity, for it was quite possible to reinfect the same animals. The protective action of the pus was not owing to hindered absorption of virulent toxin or failure of penetration of the germs into the circulation, for in reinfection the same obstacles were present as before. Possibly reinfection occurred because of the saturation of the pre-existent alexins, and failure to produce tissue owing to impeded leucocytosis. The abscesses were produced by inoculation of pure cultures of staphylococcus aureus and bacillus coli, or by starch powder suspended in sterilized water.—*British Med. Journal*.

An Artificial Larynx.—At the Lariboisière hospital Dr. Lelibeau has performed an operation for epithelioma, removing the entire larynx. After the cicatrization of the wound the only communication between the trachea and the exterior air is through a tracheal cannula. In order to enable the patient to speak, Dr. Delair has devised a new apparatus, which differs from the artificial larynx of Gussembourg and Martin, which must be placed in the wound immediately after the operation, so that the skin may grow over it. The apparatus often creates irritation, which hastens the recurrence of the epithelioma. Dr. Delair places in the opening of the tracheal cannula a small pipe, provided with a valve for breathing, which is continued by a tube of india-rubber, into which the air passes during respiration. This tube leads to a sort of artificial rubber glottis, which the patient places in the back of his mouth, where it is kept in place by a piece in the form of an artificial palate fixed to the upper jaw, and removable at will. When the subject speaks the air is driven to the back of the mouth by the rubber tube and is passed by the glottis, by which it receives a tone, which can be varied by changing the glottis or by pinching the rubber tube more or less. The articulation of the consonants is produced as usual by the movements of the lips and tongue. The sound is not very harmonious, but the patient can at least make himself understood and heard at a distance.—RICHARD ARAPU, *Pacific Med. Journal*.

A New Method of Starting Gold Fillings.—The latest method which I have been using in the preparation of cavities to be filled with gold suggested itself to me through the use of the porcelain inlay matrix. It consists in making the cavity retentive, but without the deep grooving or retaining pit, making just enough undercut to retain the finished filling. I then take a piece of No. 30 gold foil, large enough to suit the case, then proceed the same as in making the matrix for a porcelain inlay, pressing the foil in absolute contact with the cavity walls and margins, the latter being beveled as is usually done for a gold filling, the excess being pressed out over the exposed surfaces of the tooth, *i.e.* the enamel. It may sometimes be necessary to ligate the matrix in position until you have partially filled the cavity, but I have never found this necessary, because of the close adaptation of the foil to all surfaces. Those of you who have experienced the difficulty which attends the removal of a properly prepared matrix even where no undercuts exist, will readily see how this matrix will keep

its place throughout the operation. I then pack soft gold into the slight undercuts and upon the floor and walls of the cavity, finishing with cohesive. Only the smallest amount of undercutting is necessary if made in the right place, thereby reducing the encroachment upon the pulp to a minimum, which must be acknowledged to be a great consideration, especially in deep-seated cavities. The exposed surface of the matrix should be wiped off with alcohol and chloroform, and dried with hot air before commencing the packing of the gold.—W. I. SCHREIBER, *Dental Summary*.

Time-saving in the Dental Office.—One very important item in the saving of time is the careful making out of a chart, at the first examination, of all the operations required, even if it be only one tooth, for it may be a week or more before the patient comes again, during which time many mouths have been worked on, and except in cases of wonderful memories it is not easy to remember the next time we see the patient which tooth or teeth required attention. There is a great deal of time lost in aimlessly looking around the mouth for the work to be done; sometimes the patient kindly points it out, but we should have our chart before us—then it can be seen at a glance what is required, provided, of course, that each operation is carefully checked off when completed. My assistant watches the appointment book, and has the patient's chart laid out before the chair is taken. All-important in the management of practice is the care used in making appointments for operations, the arrangement of time for treatments and consultations, and the avoidance of interruptions. Engagements for operations should be made with the idea in mind of what we expect to accomplish at a given visit. In other words, we should endeavor to map out the work in advance for each patient as fully as possible. I know it is not always possible when making an engagement to exactly time the contemplated operation, and perhaps it is better to be a little liberal in the allowance of time rather than err in the opposite direction; for if the operation does not quite take up the allotted time, there is frequently more in the same mouth to be done, or if not, the spare moments can generally be utilized in many ways before the next patient appears.—HENRY C. RAYMOND, *Dental Register*.

Etiology of Scurvy.—Dr. Myer Coplans, in a communication on this subject read before the Epidemiological Society of London, February 19th (*Lancet*, June 18, 1904), reports the

results of his study of a number of cases of scurvy occurring among Europeans and natives at a military camp in South Africa. The subjects of these cases presented during life spongy, bleeding gums, lassitude, anemia, breathlessness on exertion, followed later by lameness, associated with synovitis and hemorrhages, with brawny, indurated swellings in one or both of the lower limbs. The urine was slightly acid. There was marked poikilocytosis. There were no nervous lesions. Death resulted from cardiac failure, and on post-mortem the blood was found to be fluid; there were subserous, submucous, subpleural petechiæ. The heart was thin and pale, the right side dilated, and there was excess of serous fluid in the pericardium. Scurvy in adults is not brought about by the absence of any particular kind of food from the dietary, but is more probably a specific infection of bacterial origin. The food used in the camp investigated was of the same quality and kind as that used in other camps in which there was no scurvy. In the Middelberg camp, where scurvy existed, the sanitary conditions were very poor, and many of the patients were either old or the subject of some neuroses. The infection appears to occur through the mouth, the general system being involved later and secondarily. Food may act as a vehicle under conditions of dirty storage or dirty preparation, and, considering that the disease prevails in inverse proportion to the standard of personal hygiene of the individuals affected, its infectivity would seem to depend on the unsanitary habits, and perhaps on the unwholesome occupation of those who were its victims.

The Correction of Deformities by Means of Paraffin.—Gersuny was the first to suggest the idea of correcting certain deformities by the subcutaneous injection of substances fusible by heating, and becoming solid after cooling. In the application of this idea the difficulty has been to find just the right substance to employ. Vaseline was first used, but this was found too soft; and Eckstein substituted paraffin melting at 60° C. (140° F.), but the application of this substance was found to be exceedingly difficult. The patient was likely to be burned, and sloughing resulted, or the paraffin cooled too quickly. The use of this remedy required the skill of a sleight-of-hand performer to attain success. M. Lagarde and others suggested the employment of paraffin melting at 45° C. (113° F.), but the difficulties were still so great that only extraordinary dexterity and large experience made uniform success possible. A recent improvement, however, renders the operation simple,

free from risk, and success easily obtainable. The improvement consists in the invention of a syringe by means of which cold paraffin can be employed. This syringe is furnished with a piston, which is forced in by means of a screw-thread cut on the piston bar, so that when the piston bar is turned, the piston head moves forward slowly, but with great force. The paraffin is forced through a small opening at the end of the pan into a little chamber, and thence passes on through the needle into the tissues. The syringe is filled by drawing melted paraffin into it, and allowing this to cool, or by placing in it a cylinder of cold paraffin previously prepared. By means of this instrument the paraffin can be injected leisurely, and later the injection can be easily molded by proper manipulation of the parts. The next step is the chilling of the paraffin by means of a spray of ethyl chlorid. In its improved form this method will be employed as a means of curing facial blemishes, and possibly for other purposes in which similar effects are required.—*Modern Medicine.*

Yohimbin: Its Use in the Treatment of Eye, Ear, Nose, and Throat Diseases.—

A two per cent. solution of yohimbin, either alone or in equal mixture with adrenalin chlorid solution, dropped into the conjunctival cul-de-sac from five to six times in ten or fifteen minutes will produce both corneal and conjunctival anesthesia. Marked anesthesia of the cornea lasts from thirty to forty-five minutes after the last instillation; the conjunctival anesthesia is at no time so profound as the corneal, and disappears several minutes before the latter. There is a slight stinging sensation immediately following the instillation, which becomes less and less with each repetition, finally disappearing altogether. The eye becomes immediately suffused and continues red for more than an hour after the last instillation. There is no widening of the palpebral fissure. There is a moderate but marked dilatation of the pupil, which comes on several minutes earlier after the last instillation with adrenalin and yohimbin in combination than with yohimbin alone, but lasts in either case from fifteen to twenty minutes. The slight blurring of the vision for far and near appears to be due to spherical aberration rather than to paralysis of accommodation. Yohimbin alone or in combination with adrenalin is an exceedingly mild mydriatic. Adrenalin when mixed in equal parts with yohimbin in two per cent. solution loses its constricting power upon the bloodvessels of the palpebral and bulbar conjunctiva. This last-mentioned fact suggests the idea that

yohimbin may be an antidote to adrenalin chlorid.

In view of the congestion caused by yohimbin, it cannot be considered the ideal anesthetic for operations involving the conjunctiva or muscles. As an anesthetic in cataract extractions and in iridectomy it would probably be effective. On account of the congestion produced by it, yohimbin would be inferior to cocain as an anesthetic in all operations upon the eye.—J. H. CLAIBORNE and E. B. COBURN, *Medical News.*

Field of Usefulness of the Open-Face Crowns.—

Unquestionably the objections urged against open-face crowns are well founded. At their best they have elements of weakness difficult to overcome. Nevertheless, properly made and properly placed, they have a field of usefulness all their own. Upon bicuspid teeth I have found them satisfactory and durable, especially so in cases which admit of the open face being entirely open. When the bar connecting the two sides at the gum margin can be dispensed with, the sides can be made to spring apart as the crown passes over the tooth, and to embrace more closely the tooth-neck when it is in place. The peculiar shape of the canine and incisor teeth not only increases the difficulty of making the crown fit accurately, but it also hampers us when cementing it in place. We miss the piston-like action of the tooth which assists so much in forcing the cement solidly into the intervening space when a full crown is pressed into place. Not only does the cement escape through the open face, but the screw-like motion necessary when manipulating it into place so displaces the cement that a thorough and compact filling of the space between the tooth and the crown becomes impossible. As a natural result the cementing is imperfect. To so shape the tooth as to avoid this would, in many cases, result in so serious a mutilation that devitalization and excision might be preferable.

In a recent English dental journal a suggestion is made that perhaps may have practical value. The writer suggests, instead of mutilating the tooth, to build it up at the neck by first fitting to each side of the neck of the tooth a piece of thin gold plate; to hold this in place one or two small holes are drilled through the plate and extended a short distance into the tooth, into which pins are fitted and soldered to the plate. Plate and solder are now added in sufficient amount to give the tooth a desirable shape, and filed to conform to the contour of the tooth. These are polished and cemented in place. When the fin-

ished crown extending over these additions is in position, there is no risk of their being displaced. Carefully carried out, this expedient seems promising, and is well worth a trial.—WM. H. TRUEMAN, *Dental Brief*.

Observation of a Case of Macroglossia.—Julien (*l'Echo Medical*, May 29, 1904), recording a case of macroglossia, notices the extreme rarity of the condition and the obscurity in which it is veiled. Many authors have described under this name dissimilar conditions, resembling each other only in the hypertrophy of the tongue. Macroglossia can be congenital or acquired, the latter being for the most part cases of chronic hypertrophic glossitis. The difficulty in distinguishing the two varieties is obvious, and there is no doubt as to the rarity of the congenital variety. Many authors associate congenital macroglossia with cerebral defects. Broca, who examined a large number of specimens of anencephalous fetuses, never found this condition, although Buisson affirmed that the association was fairly constant. Heredity seems to have no influence, although "maternal impression" is credited with several cases. The cause is probably due to some variety of tumor, which causes the protrusion of the enlarged tongue. The pathology is still obscure; a definite muscular hypertrophy has been demonstrated in some cases, and Virchow, who recognized lymphatic cells between layers of connective tissues, concluded that this condition was allied to congenital elephantiasis. Wegner and others have demonstrated the presence of simple or cystic lymphangiomas, and connection between macroglossia and multilocular cyst of the neck has been noted. The symptoms are obvious. At birth the tongue is not often protruded from the mouth, but later, as the enlargement progresses, protrusion takes place, with dryness, fissuring, and ulceration. The effect on the mandible and maxilla is marked, the palate being high and arched, the inferior maxilla showing an obtuse angle in the anterior part, with some luxation of the joint. The prognosis of the condition is grave. So far as life is concerned there is no danger, but a horribly offensive deformity is the penalty of not having recourse to surgery. The results of surgery have not been brilliant, owing to the difficulty of maintaining antiseptics; and even if the surgical result is good, the malformations of the maxilla are very difficult to set right. As Buisson observes: "Le prolapsus de la langue n'est pas grave que pour ceux qui n'ont jamais eu l'occasion de l'observer."

The different varieties of surgical operation

are discussed, and Julien relates a case which ended fatally after operation.—*Treatment*.

Chemistry of Anesthesia.—A valuable study of certain physical and chemical properties of solutions of chloroform in water, saline solution, serum, and hemoglobin was made by B. MOORE and H. E. ROAF and reported to the Royal Society, May 28, 1904. They set out with the supposition that the anesthetic power of the hundreds of anesthetics is dependent upon some general type of interaction between the anesthetic and the active part of the cell. As the result of their experiments they draw the conclusion that chloroform forms an unstable chemical compound or physical aggregation with the proteids experimented with, and that it is carried in the blood in such state of combination. Anesthesia is due to the formation of compounds of chloroform and other anesthetics with proteids, which compounds limit the chemical activities of the protoplasm. The compounds are unstable, and remain formed only so long as the pressure of the anesthetic in the solution is maintained. Such compounds are formed not only by hemoglobin, but also by serum proteid; and hence the position taken by the anesthetic in hemoglobin is not that of respiratory oxygen. This is further shown by the fact that the oxygen-carrying power of hemoglobin is not interfered with in the presence of chloroform. The facts upon which the authors rely as proofs of the formation of the above compounds in aggregate are as follows: Chloroform has a much higher solubility in serum or hemoglobin solutions than in saline solution or water. Even in dilute solutions at the same pressure the amount of chloroform dissolved in serum or hemoglobin solution is considerably higher than in saline solution or water. The curve of pressures and concentrations in the case of water and saline solution is a straight line, while in the case of serum and hemoglobin solution it is a curve, showing association at the higher pressures. In the case of serum, chloroform causes a marked opalescence, and also a slow precipitation at room temperature, and at body temperature a rapid, though incomplete, precipitation. In the case of hemoglobin, one and one-half to two per cent. of chloroform causes a change of color and commencing precipitation at room temperature, which becomes almost complete at the uttermost at 40° C., while five per cent. and over causes complete precipitation at 0° C. The relations between chloroform pressure and concentration in solution have been worked out throughout a long range, from below the anesthetizing

values (8 to 10 mm.) to nearly saturation in the case of water, saline solution, and serum. Attention is drawn to the important physical fact that with the same percentage of chloroform in the air breathed, serum or hemoglobin (therefore the blood) will take up much more chloroform than would water or saline solution under similar conditions. Thus at the anesthetizing pressures, and at 40° C., the coefficient of distribution in the case of water and saline solution is approximately 7.3; at room temperature (15° C.) these coefficients become 8.8 and 17.3 respectively.—*Medical News*.

Physiological Salt Solution.—While much attention has been given to the hypodermic use of salt solution in recent years, comparatively little thought has been directed to the composition of the fluid selected. The idea has apparently been that as long as a weak solution of sodium chlorid is injected the strength of the solution is a matter of secondary importance. In the majority of hospitals for many years a 0.6 per cent. solution has been aimed at, but in private practice little or no attempt has been made at exactness. This 0.6 per cent. fluid has been called the "physiological" salt solution, though more careful experiment has demonstrated that the amount of sodium chlorid in solution in the blood varies between 0.84 and 1.9 per cent. Different clinicians have advocated, in place of the sodium chlorid solution, solutions of alcohol, carbolic acid, sugar, and, indeed, of every base or acid present in the blood. It is here that a lamentable ignorance is shown of the principles involved in hypodermoclysis, for it is not enough that the injection may perhaps do good; we must be certain that it does no harm. In other words, we must not use too dilute a solution, as that will cause the blood-cells to swell and later on to part with their hemoglobin; or too concentrated, as marked shrinking of the red cells will then occur. Again, it is to be remembered that these changes that might occur in the erythrocytes are not referable to the chemical nature of the solution, nor even to the actual amount of dissolved matter present, but to the comparative osmotic action. As we know that fluids with identical freezing-points have the same osmotic pressure, it is comparatively easy to find by actual experiment the amount of sodium chlorid it becomes necessary to dissolve in a given quantity of water to obtain a solution with the same osmotic pressure as the blood, and this has been found to be not a 0.60 per cent. solution, but an 0.84 to 0.90 per cent. solution. Similarly it has been found that

the latter strength, when taken up by the blood from the subcutaneous tissues, does not cause either a swelling or a shrinking of the red corpuscles, *i.e.* it is neither too concentrated nor too dilute.

While many clinicians have been content with simple sodium solutions, further and more careful experiment by Loeb, Howell, and others has shown that the calcium and potassium salts, while not absolutely essential, are valuable in that the calcium acts as a stimulating agent to the heart muscles, while the potassium helps to a rhythmical contraction—both important considerations in the very conditions in which hypodermoclysis is indicated. The amount of potassium reckoned as the chlorid is very small, ranging according to different authorities from 0.01 to 0.06 per cent., while the calcium salt is a trifle less. Even in these small quantities experiment has shown that they are of benefit, not alone as above stated, but as preventing the earthy salts from being dissolved out of the body cells.

Matthews (*Annals of Surgery* for August 1904), who has later made a most valuable and timely contribution to the subject, recommends as an emergency solution 138 grains of sodium chlorid to the quart of water. Where accuracy is desirable and time permits, a "balanced" solution of 0.9 sodium chlorid, 0.03 potassium chlorid, 0.02 calcium chlorid to 100 parts of water may be used; or, if an alkaline solution is desired, 0.75 sodium chlorid and 0.25 sodium carbonate to 100 parts of water, the former being the solution recommended for routine use.—*Cincinnati Clinic* (editorial).

The Construction of Continuous Gum Dentures.—Starting from the swaged plate, it should be worn as high as possible all around, but highest over the canines, and the gum the fullest. Turning the margin of a plate is a slovenly method in any case, but if the plate be trimmed to its proper height, which should be done by the mouth, there is no room for bending the plate.

Instead of half-round wire use a flat wire, by passing through the rollers an 18-gauge round wire to 22-gage, this to be soldered edgewise, filing one edge flat. The posterior margin of the plate should be reinforced, after it has been fitted to the mouth, with a strip one-quarter inch wide and gage 30, extending it round the tuberosities, the inner margin to be turned up slightly to protect the edge of porcelain between the tuberosities and the wire to connect at these points. The object is threefold, *viz.* to strengthen the plate; to leave a clear margin and a thin one for any

relief that might possibly be needed at any time without marring the porcelain; and also to protect the margin of the porcelain.

The backings should have a foot-piece bent at right angles, with slits in them, so as to easily adjust to the plate, which the more firmly solders them to the latter. The pure gold must be rolled very thin, cut in pieces, and placed under the foot-pieces, and a piece under each pin, no borax being needed. The pieces should be lapped over the canines, and gold laid between to unite them. It is not necessary to shellac the teeth to prevent etching. I have no such experience as warping of plates when a proper gage of metal is used and the "doubler" added. Neither have I ever found it necessary to pack broken pieces of porcelain under the teeth. The porcelain is first applied thin and jarred well into the crevices between and under the teeth, absorbing with an old linen napkin. Then, absorbing most of the moisture from the mixture, apply it thick, packing hard, as there will be less shrinkage and the body will be more dense. Partially dry over the burner and with a quill tooth-pick—which is far superior to a steel instrument—and holding the case, as in packing, upside down, trim around the necks of the teeth and also between; dry, and use a stiff dry brush to remove all chips; then, using a small camel's-hair brush, wet

and pass around the neck of each tooth. Dry over the burner and apply with the curved end of a proper spatula the material to the palatal surface, first around the teeth and then to the palate, holding the case at first with the front of the teeth toward you. At this point some artistic work may be done by contouring the porcelain at the necks of the bicusps and molars, instead of leaving the gum at the square, short shoulder of the teeth. The canine teeth can be contoured on the lingual side, as in nature.

I used an oil furnace for one year, but when the electric oven came I purchased one, and now prefer it to the oil. The heat should be brought up gradually and the case fused—to a good glaze more than a biscuit. I transfer it at once to a cold muffle—no danger of teeth cracking. The second coating of body is now applied, first wetting the case thoroughly, and applying the material very wet and jarring it into the crevices; then absorbing, apply thicker paste, packing hard and trimming as before. The rugæ can now be formed and the case again baked, but to a gloss, placing again in the cooling muffle, one of the large oil or coke oven sort. Gum arabic is not at all necessary in the water. There is no necessity for cutting slits in the material, as there is no distortion of the plate, at least in my long experience.—L. P. HASKELL, *Dental Brief*.

HINTS, QUERIES, AND COMMENTS.

SOME OBSERVATIONS FROM THE TROPICS.

VERY little has appeared in the present dental journals from the pens of dental surgeons in the tropics. Reasons why there is such lack of intelligence from the Far East cannot be confidently stated by a single observer. The writer desires to present a few items on subjects which may interest the reader.

First of all, there is no dental organization in this section of the Far East. Every man in the profession seems to be for himself. The recent graduate may come to this part with preconceived notions and plans, which will not work in the new surroundings and circumstances. Another comes with a real lack of experience. Again, a new comer who attempts to communicate his thoughts and observations sends them forth so colored by new and first impressions that they bring to the home readers incongruities and inaccuracies. Meetings for comparison and exchange of ideas and impressions would be of great advantage. Such a society, embracing Singapore, Saigon, Hongkong, and Bangkok, would tend to discourage a certain amount of unprofessionalism which at present is manifest.

EARLY ERUPTION OF TEETH.

The early eruption of teeth is mentioned in our text-books as a peculiarity of the tropics. The eruption of the deciduous teeth conforms to the table given. The rule may be accepted for the tropics as well as for America. The difference as to time in the tropics and in America in the eruption of the teeth is quite marked. It is not a rare occurrence to see the first molar fully erupted in a child of four years. To give the exact age at which all the teeth erupt would consume too much time. A concise statement would be that permanent teeth erupt from eighteen to twenty-four months in advance of the tables given in our standard text-books. The only exception is

in the case of the third molar, especially in natives. Eruption of the third molar in the majority of cases causes much inconvenience, coming very late, at about the age of twenty-seven, and development being very rapid in the tropics, the molar at that age has a more developed bone to contend with. In the native at this age there is seldom space enough, owing to the enlargement of teeth by an incrustation of betel nut, thereby causing impaction.

EXTRACTIONS.

In private practice extractions are much more frequent than at home. First, because of the betel-chewing native, and second, the white population is largely European. An American will not permit an extraction unless absolutely necessary, while a European is indifferent, and usually prefers the less expensive method of extraction. They appear to have a fancy for artificial teeth.

The number of extractions under anesthesia is marked. The anesthetic is chloroform, and is administered by the family physician or one selected by the operator. Our American degree of D.D.S. qualifies for the administration of the general anesthetic, while the European degree does not.

Frequently the patient demands chloroform for a single root or tooth. The use of a local anesthetic is not practicable, owing to a strong prejudice which the people have acquired from their physicians. The natives prefer a local anesthetic, as they have an intense fear of a general one. The number of extractions for natives, at a sitting, ranges from two to fifteen.

THE HEALING OF WOUNDS.

There is little or no trouble with wounds caused by extraction. During the past seven years the writer has had but two troublesome cases. One was a fracture of the alveolar process, and the other from the extraction of

the third molar. The patient was unable to remove food from the cavity.

Previous to extractions the writer cleanses the tooth, or teeth, with a fifty per cent. solution of alcohol and water, and after the extraction syringes the cavity with hot water. The patient is then dismissed with instructions to wash out the cavity with hot water after each meal for three days. Other antiseptic precautions are rarely used by the writer. Upon investigation the writer has ascertained that surgical wounds in general heal rapidly without many antiseptic precautions.

NEURALGIA.

Neuralgia is a common complaint in the Far East. The Europeans call it toothache, and are greatly surprised by the relief from the administration of internal drugs. But they invariably go to their physician before visiting the dental surgeon.

DECAY OF TEETH.

One particular question that a dental surgeon is required to answer is, "Why do teeth decay faster in the tropics than at home"? Emigration from a cold or mild to a hot climate involves an entire change of life. The change may not be noticed for six months or a year. It then becomes manifest in different ways, as fever, boils, and dysentery. For one to argue that these abnormal conditions will not cause a lowering of the resistance of tooth-structure would be time wasted. In the opinion of the writer, acclimatization never takes place. The climate may be tolerated by certain constitutions, but as long as the constitution of a person has to contend with unnatural conditions, to which that person was never born, the teeth will be more and more subject to caries. The teeth are always exposed to caries, and much more so when the climatic conditions are at variance to the

natural habitat of the individual. The majority of Europeans indulge freely in alcoholic stimulants, and the climatic conditions, plus alcoholism, deprive the system of its vital power of resistance. Every extra exertion may mean another whiskey and soda, until whiskey becomes the main diet, and food obnoxious. This includes females as well. Drunkenness is not prevalent, but a constant "pegging" is.

CAPPING.

The general method of practice does not differ much from that of the West. Capping of exposed pulps is contra-indicated. In capping, numerous cases have sooner or later proved failures. During the past three or four years cases that might have been capped in a mild climate were devitalized here. In fact, devitalization is practiced entirely by the writer. Capping is successful upon the native.

CARE OF THE TEETH.

Lack of attention to the teeth in the Europeans is astonishing. The condition of most cases requires an entire cleaning before operation. After cleansing is accomplished the patient is too indifferent to keep up a moderate state of cleanliness, and will not present himself until some future trouble compels him to. This may be attributed to the general state of apathy which ensues from the so-called acclimatization. This apathy exists in regard to everything beyond what he is compelled to do. Some excuse themselves, stating that their home dentist guaranteed their teeth would require no attention for a certain length of time, usually years. The assertion of guaranteed work is undoubtedly true, and one is at a loss to understand how a dental surgeon can guarantee the services rendered any more than can a medical man.

PAUL T. CARRINGTON.

Bangkok. Siam.

OBITUARY.

DR. CHARLES MERRITT.

DIED, at the residence of his son, Dr. Chas. G. Merritt, Mt. Vernon, N. Y., at the age of eighty-nine, CHARLES MERRITT, D.D.S.

Dr. Merritt was one of the oldest practitioners of dentistry in the state of New York, he having been actively engaged in the practice of dentistry for sixty-five consecutive years. At the time of his entrance into the ranks of the profession the instruments and appliances in use were crude and hardly suitable for the purpose for which they were being

employed. Dr. Merritt followed carefully the advances of dentistry, and took especial interest in the changes and modifications in dental instrumentation in order to bring it to a level with the needs of the progressive practitioner.

His death has plunged into deep grief a host of relatives and friends who admired him both for his professional worth and for his rectitude of character.

He is survived by two sons, one of whom, Dr. Chas. G. Merritt, is a practitioner of dentistry in the city of New York.

SOCIETY NOTES AND ANNOUNCEMENTS.

SOUTHERN BRANCH OF THE NATIONAL DENTAL ASSOCIATION.

THE eighth annual meeting of the Southern Branch of the National Dental Association will be held February 21-23, 1905, at Memphis, Tenn.

J. A. GORMAN, *Cor. Sec'y*,
Asheville, N. C.

FIRST DISTRICT (N. Y.) DEN- TAL SOCIETY.

THE First District Dental Society of the State of New York will hold a clinic and exhibit at the Grand Central Palace, Forty-third street and Lexington avenue, New York city, on Monday and Tuesday, December 12 and 13, 1904. The dental profession is cordially invited.

There will be a large and interesting program, to which the clinic committee would

like to add the names of every etnical practitioner desiring to participate. Exhibitors desiring space kindly communicate with Dr. Goldsmith.

Two evening meetings, on the 12th and 13th, will be held at the Academy of Medicine, No. 17 West Forty-third street, at which papers will be read by Dr. G. V. Black, on "Extension for Prevention," and by Dr. E. K. Wedelstaedt on "The Packing of Gold in Approximo-occlusal Cavities in Molars and Bicuspsids," demonstrating his method with clay in large wooden models. Dr. Black will present something entirely new and of great interest.

The Second District Dental Society, the Central Dental Association of New Jersey, and the New York Odontological Society have been invited to attend the meetings.

S. L. GOLDSMITH, *Ch'man Clinic Com.*,
129 E. 60th st., New York city.

F. L. FOSSUME, *Ch'man Ex. Com.*,
616 Madison ave., New York city.

FIFTH DISTRICT (N. Y.) DENTAL SOCIETY.

THE semi-annual meeting of the Fifth District Dental Society of the State of New York will be held in Oddfellows' Temple, Watertown, N. Y., on Monday and Tuesday, November 14 and 15, 1904.

E. A. SMITH, *Sec'y*, Rome, N. Y.

FIFTH DISTRICT (N. Y.) AND JEFFERSON COUNTY DENTAL SOCIETIES.

UNION MEETING.

A UNION meeting of the Fifth District (N. Y.) and Jefferson County Dental Societies will be held at Watertown, N. Y., November 14 and 15, 1904. An attractive program is being arranged. Dr. F. A. Peeso and Dr. E. C. Kirk, Philadelphia, will be in attendance.

Dentists of northern and central New York are invited to be present.

E. E. HARRINGTON,
Sec'y Jefferson Co. Dental Society.

PENNSYLVANIA STATE DENTAL SOCIETY.

At the thirty-sixth annual meeting of the Pennsylvania State Dental Society, held at Wilkesbarre, Pa., July 12 to 14, 1904, the following officers were elected for the year 1904-1905: I. N. Broomell, president; H. W. Arthur, first vice-president; J. T. Lippincott, second vice-president; Geo. W. Cupit, recording secretary; V. S. Jones, corresponding secretary; R. H. D. Swing, treasurer. Executive Committee—H. B. McFadden, H. S. Seip, J. P. Nichols. Council (for one year)—H. W. Arthur, H. B. McFadden, H. N. Young; (for two years) H. M. Beck, G. L. S. Jameson, H. S. Seip; (for three years) H. C. Register, J. T. Lippincott, F. D. Gardiner. Board of Censors—W. D. DeLong, A. N. Gaylord, Ambler Tees, C. C. Walker, O. H. Uhler. Legislative Committee—F. D. Gardiner, G. L. S. Jameson, A. L. Koser, C. B. Bratt, J. T. Lippincott. Committee on Enforcement of

Dental Law—F. D. Gardiner, Geo. F. Root, H. Zimmerman, H. W. Bohn, D. C. Dunn, S. M. Stauffer, L. E. Habbeger, C. S. Beck, C. H. McCowan, B. F. Witmer, C. C. Walker. Clinic Committee—A. N. Gaylord, J. P. Nichols, H. W. Arthur. Exhibit Committee—S. P. Cameron, G. H. Jackson, C. B. Bratt. Publication Committee—Geo. W. Cupit, H. B. McFadden, R. H. D. Swing. Committee on Ethics—W. F. Litch, H. C. Register, J. A. Libbey. Committee on Oral Hygiene and Public School Dental Education—H. Newton Young, M. I. Schamberg, E. W. Bohn, J. P. Shoemaker, J. A. Libbey.

V. S. JONES, *Cor. Sec'y*.

OHIO STATE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Ohio State Dental Society will be held at the Great Southern Hotel, Columbus, Ohio, December 6, 7, and 8, 1904.

S. D. RUGGLES, *Sec'y*, Portsmouth, Ohio.

SOUTHWESTERN MICHIGAN DENTAL SOCIETY.

IN consequence of the meeting of the Fourth International Dental Congress at St. Louis in September, the meeting of the Southwestern Michigan Dental Society stands adjourned until the spring meeting to be held at Kalamazoo, April 10 and 11, 1905.

C. W. JOHNSON, *Sec'y and Treas.*

HARTFORD DENTAL SOCIETY.

At the annual meeting of the Hartford Dental Society, held October 10th, the following officers were elected for the ensuing year: G. M. Griswold, president; C. E. Barrett, vice-president; A. E. Cary, secretary; E. R. Whitford, treasurer. Executive Committee—E. H. Munger, chairman, W. S. Youngblood, A. A. Hunt. Librarian and Curator—Hugh Dryhurst. Historian—Henry McManus.

A. E. CARY, *Sec'y*.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE next meeting of the Arkansas State Board of Dental Examiners will be held December 2 and 3, 1904, in Little Rock, Ark., for the examination of all applicants. Those having applied for examination will report to the secretary Friday morning, December 2, 1904, with rubber dam, gold, plastic filling material, and instruments to demonstrate their skill in operative dentistry. Anyone who wishes may bring his own patients. As far as possible, patients will be furnished. The board reserves the right to select the cavity to be filled. The examination will cover all branches of the dental profession. No temporary certificate will be issued to anyone. Examination fee \$5.00. For further information write

A. T. McMILLIN, *Sec'y*,
Fifth and Main sts., Little Rock, Ark.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE New Hampshire Board of Registration in Dentistry will hold their semi-annual meeting December 13, 14, and 15, 1904, at the City Hotel, Manchester, N. H., for the examination of candidates for registration.

Applicants should come prepared with instruments and materials to put in one gold and one amalgam filling. So far as possible, patients will be furnished by the board.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

KENTUCKY BOARD OF DENTAL EXAMINERS.

THE Kentucky State Board of Dental Examiners will meet in Louisville, December 6, 1904, for the examination of candidates desiring to practice dentistry in Kentucky.

Application must be made to the secretary fifteen days before the examination. Candidates must be graduates of reputable dental colleges.

C. R. SHACKLETTE, *Sec'y*,
628½ Fourth ave., Louisville, Ky.

MARYLAND BOARD OF DENTAL EXAMINERS.

THE Maryland State Board of Dental Examiners will meet for examination of candidates for certificates on November 8 and 9, 1904, at the Dental Department of the University of Maryland, Baltimore, at 9 A.M.

For application blanks and all information apply to

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

OHIO BOARD OF DENTAL EXAMINERS.

THE regular semi-annual meeting of the Ohio Board of Dental Examiners will be held in Columbus, Ohio, November 29 and 30 and December 1, 1904, at Hartman Hotel.

Applications for examination should be filed with the secretary by November 19, 1904.

For further information address

H. C. BROWN, *Sec'y*,
185 E. State st., Columbus, Ohio.

ARMY DENTAL CORPS.

LEAVE for two months is granted Contract Dental Surgeon Clarence E. Lauderdale. (Sept. 23, W. D.)

Contract Dental Surg. Clarence E. Lauderdale, having reported his arrival at San Francisco, will proceed to Fort Sam Houston, Texas, for duty. (Sept. 22, W. D.)

Contract Dental Surg. John D. Millikin will proceed from Camp Jossman, Guimaras, to Iloilo, Panay, P. I., and take charge of the dental station. (Aug. 7, D. Visayas.)

Leave for three months to take effect on or about October 1, 1904, is granted Contract Dental Surg. Ralph W. Waddell, Fort Leavenworth. (Sept. 23, N. D.)

Contract Dental Surg. Rex H. Rhoades, to dental base station No. 1, Manila, for duty. (Aug. 18, Phil. D.)

Contract Dental Surg. John A. McAlister, to duty in charge of dental base station No. 3, Zamboanga, Mindanao. (Aug. 18, Phil. D.)

SWEDISH DENTAL SOCIETY.

NOTICE OF PRIZE COMPETITION.

THE Swedish Dental Society announces the opening of a competition for the writing of a popular treatise, to be entitled "The Teeth and Their Care," intended for liberal distribution by the members of the society among persons of those classes in which hygienic care of the mouth is practically unknown. The treatise must be written in the Swedish language, and must not exceed one printed sheet. The competition is open to all members of the dental profession.

Each essay should bear a motto or mark, and should be accompanied by a sealed envelope containing on the outside the same motto or mark, but bearing no indication as to its origin, and within containing the name and address of the author. The essay, preferably typewritten, should be forwarded, duly signed, not later than February 28, 1905, to the "Jury of the Swedish Dental Society," 19 Drottninggatan, Stockholm.

The committee appointed to pass on the merits of the essays that may be submitted

will primarily consider whether they fulfill the purpose of a popular treatise on the teeth and their care intended for the instruction of the rising generation in the schools and the information of the lower classes of the people. The essay should embody a plain and easily assimilable statement of the subject, free from dry details and needlessly lengthy descriptions. Original illustrations or reproductions of any already published may be incorporated to facilitate the understanding of the text. Authors should base their statements on strictly scientific facts, excluding hypotheses and doubtful theories.

The awards will be—First prize, 700 kroner (\$185); second prize, 300 kroner (\$80).

The jury appointed by the society consists of the following members: Profs. E. Almqvist and A. Lindström, with Prof. C. Wallis as alternate; also, Drs. V. Bensow, E. Förberg, and G. Forssman, with Dr. G. Modin as alternate.

The prize essays to become the property of the Swedish Dental Society.

On behalf of the Swedish Dental Society,

EMIL CHRISTENSON,
HARALD RAMBERG.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING SEPTEMBER 1904.

September 6.

- No. 769,462, to LEWIS H. ZERAN. Dentist's implement.
- No. 769,631, to FRANK L. PRIEST. Artificial tooth.
- No. 769,667, to EDGAR C. REED. Dental suction-plate.

September 13.

- No. 769,758, to JOHN MILLS. Dental instrument.
- No. 770,066, to DANIEL T. HILL. Dentistry.

- No. 770,115, to FLETCHER C. ROOD. Dental appliance.
- No. 770,162, to ROLLA M. CHASE. Dental tool.

September 27.

- No. 770,768, to JOHN R. MITCHELL. Device for securing artificial bicuspsids or molars in crown and bridge work.
- No. 770,853, to WILLIAM HARE. Combined mouth-prop and tongue protector.
- No. 770,854, to WILLIAM HARE. Dental mouth-prop and mirror, cheek distender, etc.

THE DENTAL COSMOS.

VOL. XLVI.

DECEMBER 1904.

No. 12.

ORIGINAL COMMUNICATIONS.

A STUDY OF CERTAIN QUESTIONS RELATING TO THE PATHOLOGY OF THE TEETH.

By **W. D. MILLER, M.D., D.D.S., Ph.D., Sc.D.**

(Read before the Section on Etiology, Pathology, and Bacteriology of the Fourth International Dental Congress, at St. Louis, Mo., August 31, 1904.)

[AWARDED THE GOLD MEDAL BY COMMITTEE ON PRIZE ESSAYS.]

(I.)

IT is a fact accepted by the great majority of dental scientists and practitioners throughout the world that the chemico-parasitic theory of dental caries presents a fairly satisfactory explanation of the phenomena exhibited by this disease. Generally speaking, we recognize two stages in the destruction of a tooth by caries: first, decalcification of the hard tissue or tissues of the tooth; second, the dissolution of the decalcified organic matrix. The decalcification is brought about by the action of acids produced in the mouth chiefly by the fermentation of carbohydrates; the dissolution of the organic matrix is a result of the digestive action of ferments of the nature of trypsin produced by bacteria. In the case of the enamel the decalcification is equivalent to total destruction, and the second stage is practically wanting.

There are, however, certain phenomena relative to the occurrence of caries in

different mouths which, though of the greatest interest from a scientific as well as from a practical point of view, have not yet found a solution which meets with general approval.

Foremost among these phenomena stands the well-known fact that of two individuals living under the same conditions the one may be absolutely free from caries while the other has scarcely a tooth in his mouth which does not show the ravages of this disease.

Formerly it was assumed that the cause of the marked difference in the susceptibility of different teeth to caries was to be sought for in the teeth themselves, and hard, well-calcified teeth were supposed to suffer little from caries in comparison with soft, poorly calcified ones. More recently some writers, basing their belief on the chemical investigations of Black and others, which show that so-called hard teeth contain but very

little more calcium salts than soft teeth, have questioned the truth of the above supposition, and claim that the cause is not to be sought for in the teeth but in their surroundings. Others, finally, lay great stress upon the diathetic factor, although, if it could be definitely established that certain diatheses are accompanied by a high degree of dental caries, this would not affect the problem as to the ultimate cause. It is evident that caries of the teeth must be the result of two groups of forces acting upon each other, and that the one group is to be sought for in the teeth themselves, the other in the surroundings of the teeth. A diathetic condition comes into consideration as a cause of caries in as far as it modifies one or both of those two groups of factors.

Under the first group, the chief and practically only factor to be considered is the resistance which the tissues of the tooth offer to the destructive action of acids. A second, minor factor is the resistance that the decalcified dentin offers to the digestive power of bacterial ferments.

Under the second group the quantity as well as the physical and chemical character of the saliva, its possible bactericidal action, the nature of the food, the shape of the teeth and their relative positions, the nature and number of bacteria in the mouth, etc., must receive consideration.

It seemed to me that the only way which offered any hope of a possible ultimate solution of the question would be to take up each factor in succession and determine its influence as a possible direct or indirect agent in the causation of dental caries. This is the plan adopted in the experiments which I have carried out during the last five years; and although I have not succeeded in concluding the work at the present time, I feel justified in risking the statement that the foundation has been laid and a plan of work inaugurated which must finally lead to a definite solution of this very intricate problem.

We begin, then, with the causes lying outside of the teeth.

(1) THE QUANTITY OF THE SALIVA.

A strong flow of the saliva tends, except in deep cavities where it scarcely penetrates, to dilute the acids produced by fermentation in the mouth, also to wash away small particles of food and to prevent their adhering to the surfaces of the teeth. Its action is of course limited to surfaces with which it comes directly in contact, and in deep cavities full of food it will be very slight. During sleep it practically ceases altogether.

I have repeatedly found a cessation or marked diminution in the secretion of saliva as expressed in constant dryness of the mouth, difficulty in swallowing, etc., to be accompanied by acute caries attacking nearly all of the teeth simultaneously and often extending upon the free surfaces. Particles of food remain sticking to the teeth and the acid secreted acts in full strength upon them. (See under (4), page 986.)

The amount of saliva which flows from the glands during a dental operation must not be taken as a necessary index of the amount normally secreted.

(2) THE VISCIDITY OF THE SALIVA.

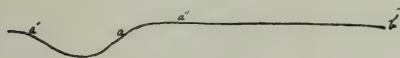
Saliva containing much mucus—stringy, sticky saliva—is conducive to caries in as far as the stickiness interferes with the self-cleansing process in the mouth. Bacteria appear to proliferate also slightly better in saliva containing much mucus. The importance of this factor has, however, been overrated by some authors. I have met with a number of persons free from caries who had extremely viscid saliva, and on the other hand have seen many cases of total destruction of the teeth associated with very thin saliva. Observations extending over a very large number of cases, in 170 of which the character of the saliva was carefully noted, have confirmed this view. The view recently promulgated by Lohmann, that caries of the teeth *is due solely to the action of the mucin of the saliva*, stands at variance with some of the simplest facts of dental pathology and bacteriology to such an extent

that it hardly seems indicated to enter into a discussion of it here.

(3) THE REACTION OF THE SALIVA.

A great diversity of opinion exists as to the effect of an alkaline or acid reaction of the saliva upon the course of dental caries. In view of the fact that acids even in a very dilute condition act upon calcified tissues such as bone and dentin, most dentists look upon an acid reaction of the saliva as particularly injurious to the teeth, and as accelerating the progress of caries. Others take the view that an alkaline reaction of the saliva is more likely to be accompanied by caries of the teeth than an acid one. They base this view on the fact that bacteria grow better in alkaline than in acid solutions, and must accordingly de-

A



velop in greater numbers and bring about a more intense fermentation in alkaline than in acid saliva. The advocates of this view overlook the fact, however, that the reaction must in all cases become acid before caries can set in, and that accordingly the bacteria which cause the first stage of caries must all operate in an acid medium.

The problem is in one respect very much like that of two men running a race over a course such as mapped out in the accompanying diagram A, the goal being at *b*, the starting-point at *a* or *a'*. The first runner takes up his position on the ascending slope at *a*, the other in order to get a good start takes his position at *a'*. He starts off more rapidly than his opponent, but forgets that he will have to take the whole of the upward slope, and that by the time that he has reached *a*, his opponent will be well ahead at *a''*, and if they are pretty evenly matched he will have difficulty in overtaking him. So, too, bacteria which begin the race in an alkaline medium start out just so

much behind those which begin in an acid medium.

A factor, however, comes into action in the case of fermentation by bacteria which is not present in the problem of the runners and which tends to bring about a different result. To adapt this case to the problem of acid production by bacteria, let us suppose that two companies of bacteria, A in an alkaline and B in an acid solution, enter upon a contest as to which can bring about the stronger acid reaction in a given time. Company B is at an advantage in having a certain amount of acid already on hand, while company A must first produce enough acid to neutralize the alkali present before it can begin to accumulate at all. On the other hand, the bacteria in company A have the advantage in that, being in a more favorable medium, they proliferate much more rapidly, and in the course of an hour or two they may have twice as many bacteria at work as their opponents in company B, which would enable them finally to manufacture more acid than they. This development of the question may be made clear by the following experiments.

The mouth was thoroughly rinsed with water and the rinsings allowed to stand for five minutes in a test tube till all the coarser particles had settled to the bottom. 1 cc. of the water was then drawn off and added to 99 cc. of beef-extract-peptone bouillon containing 3 per cent. of sugar.

This was then divided into two portions, A and B, of 50 cc. each, and to A 2 cc. of a 10 per cent. solution of sodium bicarbonate, to B 3 cc. of a five per cent. solution of lactic acid was added. The portion A was thereby made distinctly alkaline and B correspondingly acid. Each portion was now distributed in ten test tubes containing 5 cc. each and placed in the incubator. The *relative** numbers of bacteria present in the two sets of tubes at different periods may be seen in the following table:

* To obtain the actual number, multiply by 400,000.

	Alkaline tubes.	Acid tubes.
At beginning	76	76
After 1½ hours.....	169	83
“ 4 “	875	250
“ 6½ “	1125	475
“ 23 “	2800	856
“ 30 “	150	72
“ 48 “	750	800
“ 72 “	950	740

A much more rapid increase of bacteria took place in the alkaline than in the acid tubes up to twenty-three hours, after which the number fell off suddenly, to increase for a second time later on. It was likewise observed that the acid accumulated very rapidly in the first few hours, then came a period where very little acid was produced, which was followed by a period of renewed activity.

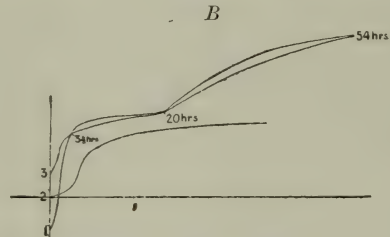
In a second experiment 50 cc. of saliva with finely chewed potato and a small amount of bread was divided into two equal portions of 25 cc. each. To the first portion I added 1 cc. of a 10 per cent. solution of sodium bicarbonate, to the other 1 cc. of a 5 per cent. solution of lactic acid. The two portions were then distributed each in 5 tubes of 5 cc. each and put in the incubator. The relative number of bacteria in the tubes at the intervals indicated were as follows:

	Alkaline tubes.	Acid tubes.
At beginning	112	112
After 2½ hours.....	650	236
“ 6½ “	1775	600

Here, again, we notice the comparatively rapid increase of the number of bacteria and the stormy character of the fermentation in the alkaline tubes in the first few hours. (See curve in diagram B.) In 1½ hours the mixture in the alkaline tubes had become neutral; in 3½ hours the degree of acidity was the same in both tubes, a tube of either set requiring 11 drops of a five per cent. solution of sodium bicarbonate to neutralize it.

The further progress of the fermentation is indicated by the curves 1 and 2 in diagram B in comparison with the fermentation of a 2 per cent. solution of grape sugar in bouillon (curve 3). Again we see a period of comparative rest followed by a slight increase in activity.

The conclusion forces itself upon us here that the fermentation may be inaugurated by one group of bacteria which later on suffers from the action of its own products and is gradually replaced by another group more resistant to acids. This conclusion is supported by the results of experiments published in the second German edition of “Micro-organisms of the Human Mouth,” in which a mixture of foodstuffs with saliva was allowed to stand for four days. The analysis gave—Free lactic acid 0.104, free acetic acid 0.156, combined acetic acid 0.139. It appears that lactic acid



- 1. Acid production in alkaline tubes.
- 2. “ “ “ acid tubes.
- 3. “ “ “ neutral 2 p. c. sol. grape sugar.

may be first formed and later acetic. This very interesting and important problem I hope to solve definitely through experiments now in progress.

In a third experiment I started out with alkaline material only, adding 4 cc. of a 10 per cent. solution to 96 cc. of potato in saliva chewed up so as to form a fine emulsion. The results were as follows. The alkaline reaction at beginning is indicated by the minus sign:

	Acid units in 5 cc.	Bacteria.
At beginning	-6½	125
After ½ hour.....	-6	
“ 1¼ hours.....	-3	235
“ 1¾ “	0	
“ 2¼ “	3	1550
“ 3¼ “	8	
“ 4 “	10	3000
“ 5 “	12	5000
“ 6 “	13	3000
“ 7 “	13	1300
“ 8 “	15	650
“ 23 “	20	185
“ 29 “	22	55
“ 32 “	25	90
“ 52 “	30	29
“ 78 “	33	750

We note here again the very rapid increase in the acidity in the first few hours; a marked second stage in the acid production is wanting. *These results if confirmed by the further experiments which I have mapped out will teach us that when foodstuffs which are impregnated with alkaline saliva lodge between*

time and in superficial cavities; during the night and in deep cavities it will have but slight influence.

Taking all things into consideration, we are forced to the conclusion that the chances for the production of caries are about as favorable in a mouth with alkaline as in one with acid saliva. This

FIG. 1.



Dentin from a case of caries acutissima, showing but slight invasion of bacteria and slight histological changes.

the teeth or in cavities of decay a more rapid development of bacteria will take place in them than when the reaction of the saliva is acid, the result being that the alkali is soon neutralized and a degree of acidity brought about equal to or slightly in excess of that produced where the saliva had an initial acid reaction. The excess is, however, inconsiderable and its action is offset by the fact that it set in later, and also by the fact that it is constantly being to a certain extent counteracted by the afflux of alkaline saliva. This latter factor will, however, come into account only during the day-

result agrees with the evidence which I have obtained from statistics, and also accounts for the fact that opinions among practitioners are divided as to whether an alkaline or acid reaction of the saliva is more favorable to caries. This result is of course valid only under normal conditions, where the reaction whether acid or alkaline is never intense. We occasionally meet with a case where the acid reaction of the oral secretions is pathological and so intense that its deleterious influence upon the teeth is very marked.

A case of this kind came under my treatment only yesterday (June 27th),

in which not only do all of the upper teeth of a boy of ten years show extensive approximal caries, but the free facial surface of the smooth enamel is perfectly white and decalcified to a depth of $\frac{1}{4}$ to $\frac{3}{4}$ mm. On the upper left bicuspid the whole of the external enamel wall has been eaten away and the dentin stands completely uncovered, being also decalcified to a considerable depth. The decalcification is here of such a nature and so located as to preclude the possibility of its being produced by fermentation of food alone. The secretions of this boy's mouth are very slight in quantity and intensely acid.

A piece of softened dentin was peeled out of one of the cavities and sections made with the freezing microtome. One of these, stained by the Gram method, is reproduced in Fig. 1. It shows the comparatively small degree of penetration by bacteria characteristic of acute caries produced under a strong acid condition.

On the other hand, a strong alkaline saliva will exert a protective influence upon all exposed surfaces of the teeth, and upon such as have only shallow retaining points or spaces for food.

Preiswerk argues for the existence of an alkaline caries on the ground that acids acting upon enamel always bring out the striation of the enamel prisms, while this striation is sometimes wanting in caries. I have, however, many slides of teeth decalcified in acid media in which the striation is not present. (Figs. 2 and 3.) The absence of striation does not therefore disprove the agency of acids.

(4) THE INTENSITY OF FERMENTATION IN MIXTURES OF FOODSTUFFS WITH SALIVA.

In "Micro-organisms of the Human Mouth" (page 110), 0.75 per cent. is given as the maximum of lactic acid which develops in *solutions* of carbohydrates, and this proportion has been confirmed by other observers. Recent experiments have shown me, however, that in mixtures of saliva with foodstuffs, particularly bread,

a much more active fermentation takes place and a greater degree of acidity is produced than in simple solutions of carbohydrates in bouillon or saliva.

This is definitely proved by the following experiment: 5 cc. of a mixture of bread with saliva made by reducing the bread to a fine state of division in the mouth, the same amount of a 2 per cent. solution of grape sugar, and also of a 0.2 per cent. solution of glycogen in saliva were placed in the incubator in similar glass vessels.

In one hour the bread-saliva mixture showed decided acid reaction. The same degree of acidity did not appear in the solution of grape sugar till after four hours. The glycogen solution developed only a trace of acid and subsequently its reaction became alkaline. In four hours the reaction of the bread tube was intensely acid.

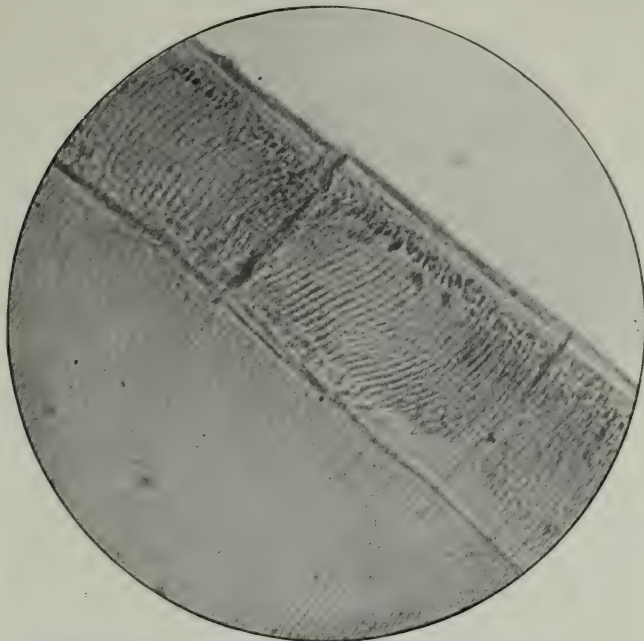
Sections of dentin in the same showed beginning decalcification in five hours, in the grape sugar tube in twenty-four hours. At the same time the contents of the glycogen tube had an offensive smell and had taken on a slight *alkaline* reaction.

In another experiment three test tubes received each 5 cc. of a mixture of bread and saliva, finely triturated in the mouth. To one I added 2 per cent. of grape sugar, to the second 0.5 per cent. of glycogen; the third tube received no further ingredient. The three were placed in the incubator and the development of the fermentation watched. It was found that the addition of grape sugar or glycogen did not in the least influence the intensity of the fermentation or the amount of acid formed in twenty-four hours.

I have occasionally found a quantity of acid having a neutralizing power for sodium bicarbonate equivalent to a 2 per cent. solution of lactic acid to be produced in a mixture of saliva and bread in three days.

We may conclude from these results that the intensity and rapidity of fermentation in foodstuffs retained in the mouth is very great, and practically independent of small amounts of soluble carbohydrates which may be present in the saliva.

FIG. 2.



Superficial decalcification of enamel without striation.

FIG. 3.



Total permeation of enamel by acid without increase of striation.

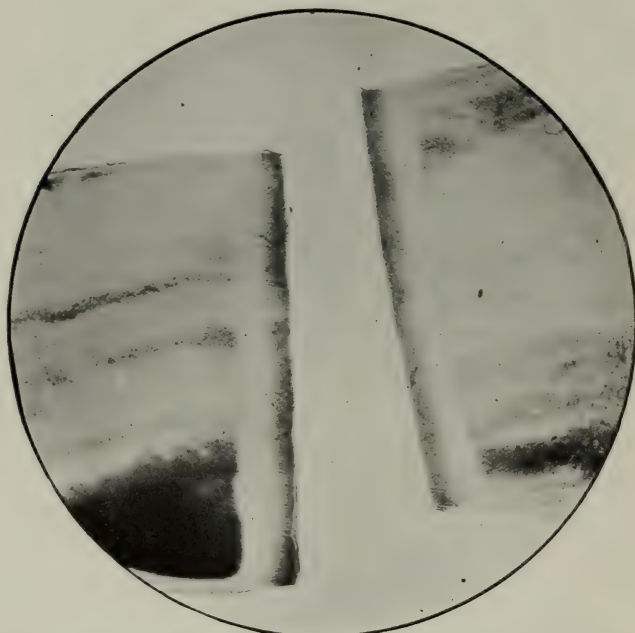
(5) THE ANTACID ACTION OF THE CALCIUM SALTS CONTAINED IN THE SALIVA.

In the *Independent Practitioner* for 1886 (page 536) I have given some data relating to this question, the discussion of which may here be resumed with profit. Lime salts are often spoken of as antacid and therefore as speedily neutralizing the acids of decay. This is only partly cor-

laetic acid and in the same solution saturated with calcium phosphate. I obtained in repeated experiments the astonishing result that no appreciable difference appeared in the amount of decalcification.

The amount of calcium salts carried off by the saliva varies greatly in different persons, as evidenced by the very great difference in the amount of tartar deposited on the teeth.

FIG. 4.



Pieces of dentin exposed for two days on one surface to the action of a 1 per cent. solution of lactic acid; in the right piece the solution being supersaturated with calcium phosphate. Very slight difference in the degree of decalcification.

rect. The calcium carbonate is antacid, but the phosphate, which makes up the bulk of calcium salts in the saliva as well as in the teeth and in tartar, is not. Add as much calcium phosphate to a weak solution of lactic acid as it will dissolve, and it will be found to the litmus test to be as strongly acid as before, the lactate and lactophosphate of lime being formed and phosphoric acid set free. The power of the solution to decalcify may be slightly diminished, not destroyed.

Corresponding pieces of dentin were suspended in a 1 per cent. solution of

The analyses of Frerichs, Jacobowitsch, and Herter place the average amount of inorganic salts in the human saliva at 0.17 per cent., of which but a fraction, say 10 per cent. on a very liberal estimate, consists of calcium salts. Ten times this amount, in the form of 0.075 per cent. phosphate and 0.025 per cent. carbonate of lime, added to a mixture of saliva and bread, did not have the slightest effect upon the course of the fermentation or upon the amount of acid produced.

The antacid action of calcium salts in

the saliva as a preventive of caries may accordingly be estimated at zero.

(6) ACTION OF FERMENTABLE CARBOHYDRATES IN SOLUTION IN THE SALIVA AS A CAUSE OF CARIES.

This question I have discussed in the *DENTAL COSMOS* for 1903 (page 694) with particular reference to glycogen, establishing the fact that fermentable carbohydrates are found in the mouth after each meal in which carbohydrates are taken as food, but that neither glycogen nor any other fermentable carbohydrate occurs in the saliva under normal conditions in sufficient quantity to materially influence the origin and process of caries. If the saliva as it flows from the ducts contained enough fermentable carbohydrate to appreciably affect the course of caries by undergoing an acid fermentation in the mouth, then it would be a simple matter to establish its presence experimentally. The person whose saliva is to be examined would need only to rinse his mouth very thoroughly and then eject some 5 to 10 cc. of saliva, which should be filtered and placed in the incubator. If glycogen be present in any quantity which could affect the course of dental caries the saliva will show an acid reaction in a few hours.

The results of my experiments forced me to the conclusion stated above, and further experiments more recently carried out in this line have confirmed this conclusion.

Again, if we filter a solution of glycogen it remains opalescent, likewise if we add 0.1 per cent. of glycogen (which is the lowest concentration which shows a trace of acid fermentation) to saliva and filter we get an opalescent filtrate, and if the saliva contained a sufficient amount of glycogen to be susceptible of an acid fermentation it should likewise give a cloudy filtrate. I have found, however, that saliva comes through the filter quite clear in cases of most aggravated caries as well as in cases immune to caries. I have met with but very few exceptions to this rule, and they stood in no relation to the degree of caries. Stale saliva is

cloudy even when filtered, because of the large number of bacteria which it contains.

The results of all my investigations seem to fully justify the conclusion drawn above, that no fermentable substance of the group of carbohydrates occurs in the saliva in sufficient amount to materially influence the progress of caries. This result accords with that obtained under (3) and (4).

(7) THE CHARACTER OF FOOD.

There can be no doubt that an excess of carbohydrates of a readily fermentable nature, especially if soft, sticky, and slowly soluble, greatly intensifies the process of fermentation in the mouth and accelerates the course of decay.

The following case, which is by no means an isolated one, very clearly illustrates this point. Master A, thirteen years old, showed caries of all of his upper teeth without exception; in the lower jaw two molars and one bicuspid had been extracted and the remaining bicuspids and molars standing far apart and offering no retaining points for food were free from caries, but the lower incisors and canines were all decayed. The saliva was normal in quality and quantity. This boy, besides never brushing his teeth, lived almost exclusively on carbohydrates, eating no meat whatever for breakfast and supper, and only occasionally (once or twice a week) for dinner.

In view of the fact that races both of men and animals that live solely on meat are free from caries, and in view of the many observations and experiments already published, this point may be considered as established beyond discussion, though it does not always receive the attention which it merits.

The physical properties of foodstuffs also form a quantity not altogether negligible.

Certain foodstuffs as a rule lodge about the teeth; others do not. This may be easily seen by eating a biscuit or a piece of cake and observing how many particles lodge in crevices, while fibrous foodstuffs are not so liable to lodge. (Wallace.)

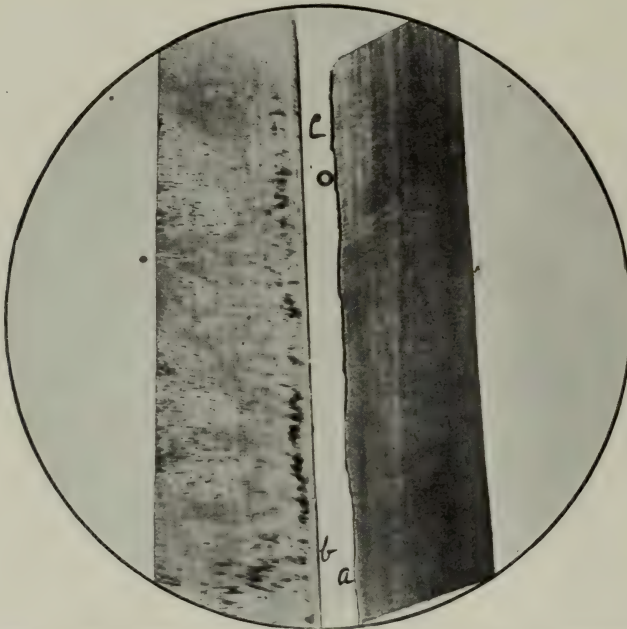
In general sticky, doughy, and semi-soluble substances will be found to be most injurious to the teeth.

Cooking our food not only renders it more fermentable, but also more sticky and liable to lodge about the teeth. This factor contributes, accordingly, not a little to account for the increased tendency of civilized races to caries of the teeth.

half immersed in turpentine or melted butter and afterward exposed to the action of weak acids were considerably less decalcified on the surface which had received the protecting coat of fat. (Fig. 5.)

This is readily understandable. We likewise know that very loose molars in the mouth without antagonists are usually found to be covered with a greasy

FIG. 5.



Pieces of ivory protected by a coating of fat at *a*, and of turpentine at *b*. The black lines indicate the degree of decalcification, which is much more pronounced at the unprotected ends, *c*.

(8) THE ACTION OF FAT ON THE TEETH.

It is known that the enamel of the teeth contains a minute quantity of fat, and Professor Liebreich of the University of Berlin used to maintain that the object of this fat was to protect the tissue against the action of acids. I am not prepared to accept this view myself, but I am convinced that the more or less fatty character of our foodstuffs does have a certain modifying influence upon the course, or at least upon the origin of caries. Pieces of ivory which had been

deposit, and that they do not decay in this condition.

Undoubtedly a coating of fat on the surfaces of the teeth such as might be formed on partaking of food rich in fat would tend to protect them against the action of acids; the question, however, arises in this connection whether fat itself may not undergo decomposition in the mouth resulting in the production of acids. This, however, is not probable in view of the fact that fats mixed with saliva and kept at blood temperature give rise to an alkaline and not an acid reac-

tion. This fact makes it all the more probable that fats act to a certain extent as protectors of the teeth.

J. Sim Wallace ("The Cause and Prevention of Decay in the Teeth") writes: "I have made numerous observations which seem to me to indicate that the relative freedom from caries among people who eat much fat is out of all proportion to what one might expect if one considered fat as neutral in its action on the teeth. Nor do I think that we can account for this freedom from caries in fat-eaters by the fact that these people may eat relatively less carbohydrates."

(9) THE SELF-CLEANSING FACTOR IN IMMUNITY TO DECAY.

Different dentures show very marked differences in regard to the efficiency of cleansing processes, whether spontaneous or artificial. In some the crowns of the teeth are so well formed and arranged and knuckle up together so perfectly that as long as the interdental papillæ are in a healthy condition there is little possibility for food to lodge. In others we find the food sticking between the teeth everywhere. There can be no doubt that this circumstance is of very considerable consequence in regard to the origin and progress of caries. All places where food habitually lodges and can be only imperfectly removed are especially liable to decay. For example, when a bicuspid stands inside of the arch so as to form a triangular space with the neighboring teeth all three teeth are sooner or later doomed to decay. Likewise when the gums recede in old age and the spaces between the teeth easily become packed with food we find extensive caries (senile caries) occurring in dentures which for fifty or sixty years may have been practically immune.

All the cases of immunity to caries which I have examined during the last few months have related to dentures where there was little tendency to retention of food particles.

The comparative immunity of the lower front teeth to caries is due in a great measure to the fact that the food

particles do not readily lodge about them, or if they do—as is particularly the case in advanced age when the gums recede and the teeth loosen—then these teeth decay as readily as any others.

(10) THE ANTISEPTIC ACTION OF THE SALIVA.

This question I have treated at length in the DENTAL COSMOS for 1903, page 1. The numerous experiments there reported upon have definitely established the fact that neither the oral fluids as a whole nor their separate constituents (mucus, potassium sulfocyanid, etc.) have the power to prohibit or even perceptibly retard the growth of bacteria.

There are neither simple chemical antiseptic compounds present in sufficient concentration to exert a bactericidal action nor have I been able to find the more subtle protective bodies (analogous to the alexins of the blood) in the saliva. In other words, the protective bodies of the normal blood serum (alexins, complements, cytase) do not under normal conditions pass into the saliva in sufficient quantity to be detected by ordinary means.

(11) THE ACTION OF BACTERIAL PLAQUES.

This question has been thoroughly discussed in the DENTAL COSMOS for 1902, page 425, where the conclusion is arrived at that bacterial plaques are essential neither to the beginning nor to the progress of caries, nor does their presence necessarily result in the production of caries. It is possible that they may intensify processes of decomposition in particles of food clinging to the surface of the teeth. Nothing is easier than to find dense films without a trace of caries (Fig. 6), and we may also find caries without films (Fig. 7). In this connection I must refer to my previous publication. Further experiments which have just been concluded tend to confirm the view expressed therein.

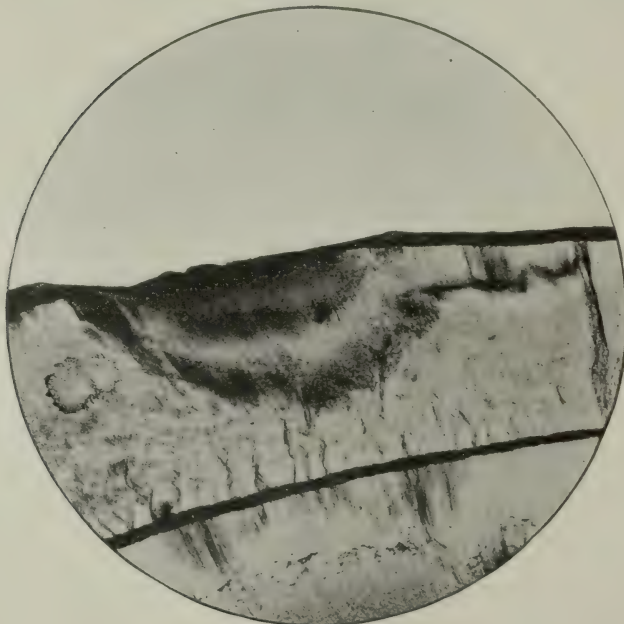
From freshly extracted teeth with sound surfaces the film was removed from a zone about 2 mm. wide, by means

FIG. 6.



Extensive bacterial plaque without a trace of caries. (A very common occurrence.)

FIG. 7.



Extensive caries without plaque.

of a wood point dipped in tooth-powder. The teeth were then put in a small glass jar, covered with bread or bread and meat finely chewed up, and put in the incubator. The mixture was daily renewed, the teeth being at each time slightly rinsed in pure water. I reasoned that if the film performed any particular rôle in condensing the acid upon the surface of the tooth, then the parts of the tooth from which the film had been removed should be less acted upon by the mixture than those still covered with the film. The results did not indicate any such action on the part of the film. On the other hand, in one series of experiments the parts from which the film had been removed were more intensely attacked by the acids than those still covered by it. This result is very clearly shown by the photograph. (Fig. 8.)

In this case the film apparently served as a protection to the tooth. This mixture was, however, allowed to stand during the last four weeks of the experiment without renewal, and it was probable that the bacteria in the film were destroyed by the action of the acid. The experiment was therefore repeated, the mixture being renewed every twenty-four hours throughout the whole time. Here, again, the results show that the surface covered by the film did not suffer any more from the action of the acid than that which was free. In Fig. 9 we have the cusp of a bicuspid which was naturally without film on the buccal surface, *b*, but with a thick plaque on the surface *a*.

This tooth was exposed for four weeks to the food mixture, changed daily, with the result that the free surface, *b*, was decalcified to the same extent as the coated surface, *a*.

We of course cannot be sure that the plaques maintain their normal activity in these food mixtures; it is fair, however, to suppose that they do so for a certain time. Further experiments in this direction are indicated.

I am convinced, however, that when food lodges between two teeth and fermentation sets in, the acid produced thereby will attack the tooth as readily without the agency of a film as with it.

The film may, however, have a deleterious influence by favoring the precipitation of fine particles of food upon the surface of the tooth.

(12) THE NUMBER AND KIND OF BACTERIA IN DIFFERENT MOUTHS.

This is one of the most difficult problems with which the dental bacteriologist has to grapple, and a vast number of experiments is necessary in order to enable us to eliminate the various sources of error which are present. One of the most formidable difficulties is to be encountered in the fact that many of the bacteria of the mouth cannot be made to grow as isolated colonies on our artificial culture media. In consequence of this difficulty I have not been able to terminate my work relative to this question, and must reserve my decision for a future occasion.

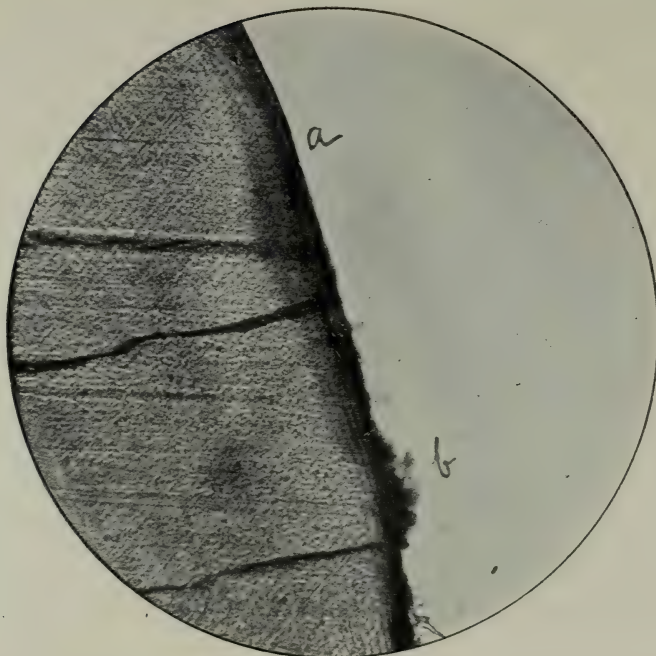
The necessity of a definite answer to this question becomes less imperative in view of the fact that it is virtually included in the following question (13), which is more readily accessible to an experimental solution.

(13) DO PROCESSES OF FERMENTATION GO ON DIFFERENTLY IN DIFFERENT MOUTHS?

Does a particle of food lodged between the teeth of A undergo a different process from that of a like particle between the corresponding teeth of B? It is self-evident that a solution of this question releases us for the present from the necessity of definitely disposing of question (12).

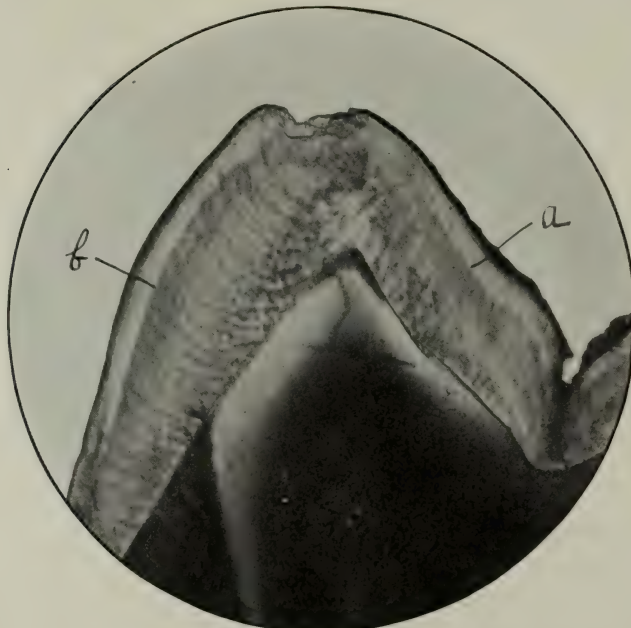
It is not the mere presence of this or that kind of bacterium in certain numbers in the mouth, but rather the joint activity of the total flora of the mouth as expressed in the first instance in the intensity of processes of fermentation in food particles which determines *ceteris paribus* the extent of caries. I have endeavored to solve this question by an extended series of experiments in and out of the mouth which have been reported upon in the DENTAL COSMOS. The re-

FIG. 8.



Section of tooth after seven weeks in bread-saliva mixture, the film having been removed at *a*. Apparent protective action of film at *b*.

FIG. 9.



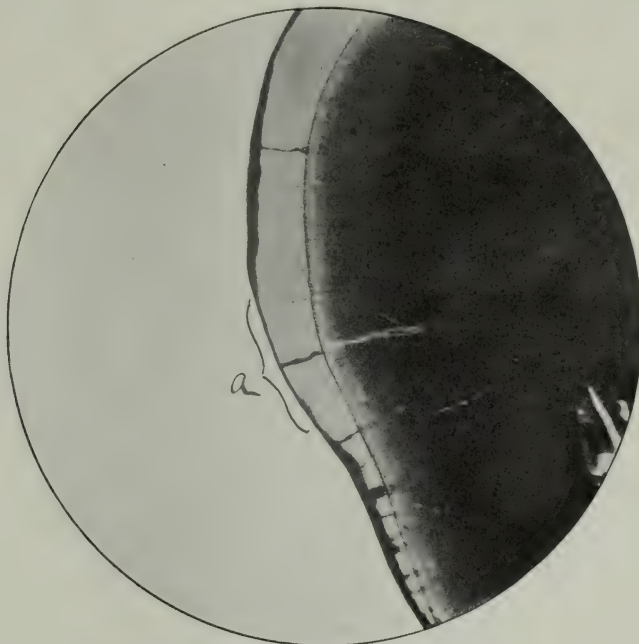
Cusp of bicuspid after exposure for four weeks to food mixture; the filmed surface, *a*, is not more acted upon than the filmless surface, *b*. (The section having been cleared up in xylol, the decalcified layer here appears lighter.)

sult of all these experiments was embodied in the following conclusion (Cosmos, 1903, page 689): "The saliva of immunes develops in the presence of carbohydrates, in and out of the mouth, on an average a little less acid than that of highly susceptible persons. The difference is, however, not constant and is not sufficiently marked to account for the marked differences of susceptibility."

indirectly favor the production of caries, some of which tend to counteract this influence, and some of which are practically indifferent in their action on the teeth.

Some of those factors, such as the character of food, are of predominating influence. The use of albuminous substances alone to the total exclusion of carbohydrates or *vice versa* is of itself sufficient to readily account for the fact that

FIG. 10.



Protective action of deposit of tartar (at a).

(14) PROTECTIVE ACTION OF DEPOSITS OF TARTAR.

It is a recognized fact that deposits of tartar thoroughly protect the incrustated surface. *Experimenti causa* I suspended a tooth having a nodule of tartar (at a, Fig. 10) in solution 4. The surface was completely protected until the tartar was finally dissolved away and the acid then began to act upon the enamel at this point also.

We see from the above that a large number of factors are constantly at work in the mouth some of which directly or

one race (Eskimos) may be immune to caries and another suffer in an extreme degree from it. Likewise a total or nearly total cessation of the salivary secretion is sure to be followed by a marked exaggeration of the tendency to caries.

We may also conceive that of two persons having teeth of the same resisting power and living under the varying conditions presented in modern civilized life, the one in whose case all of the partial factors above referred to tending to the production of caries operate in conjunction may suffer very much, the other

in whom they are absent may be practically free from caries. Extremes in which all or even a great majority of the factors predisposing to caries are either present or absent are, however, the exception rather than the rule, and we frequently enough meet with cases for which those external causes alone do not furnish us with an explanation which is quite satisfactory to us, and the question forces itself upon us whether there may not be something in the teeth themselves which furnishes a clue to a solution of the phenomenon under consideration.

It is true that we have been in the habit of speaking of soft teeth and hard teeth, and of looking upon those terms as synonymous with susceptibility and non-susceptibility to caries. An experimental proof of the truth of this belief which puts it beyond the possibility of a doubt has, however, been wanting.

At present opinions are divided between two views diametrically opposed; the one, of which G. V. Black is the chief exponent, finds its expression in the following statement (DENTAL COSMOS, 1895, page 417): "Examinations of the density of the percentage of lime salts and of the strength of the teeth that are certainly reasonably accurate and include a sufficient number upon which to base trustworthy judgment, have shown that neither the density nor the percentage of lime salts nor the strength is in any degree a factor in predisposing the teeth to caries, or in hindering its inception or progress."

I have, however, repeatedly called attention to the fact that it is not solely a question of the percentage of calcium salts in a tooth, but of the stability of the compound formed by those salts with the organic matrix of the tooth.

The rate at which any calcareous body is acted upon by acids does not depend solely upon the percentage of calcium salts which it contains, but upon the stability of the compounds formed by them. A piece of tartar may contain more calcium salts than an equal sized piece of dentin and yet it will be much more readily decalcified than the latter.

Unfortunately our knowledge of the nature of the combinations occurring in teeth and bone is very incomplete, nor does it at present appear just how we are to approach this question experimentally. It is quite conceivable theoretically that two teeth may contain exactly the same percentage of calcium salts and still possess different degrees of chemical stability.

The other and opposite view is that held by the majority of dental practitioners, and which claims that teeth of different grades (hard and soft) are liable to be attacked by caries in different degrees. This view has of late years found its chief exponents in Röse and Förberg, who by the aid of statistics have endeavored to show that people who live in districts in which the soil and drinking-water contain much lime have teeth better calcified (harder) and suffer much less from caries than those who live in districts which are poor in lime. In view of those different opinions, both arrived at by most thorough and careful investigations, it seemed to me to be imperatively necessary that the question should be experimentally and finally determined whether the yellow or yellowish (so-called "hard") teeth do or do not offer more resistance to acids than the bluish or gray-blue (so-called "soft") teeth do.

The idea that different teeth offer different resistance to the same destructive forces appears to be supported by the evidences of daily observations in dental practice. We continually meet with cases where two teeth in contact have been acted upon to very different degrees. (Fig. 11.)

It is a very common thing to find one of the bicuspid decayed to the pulp while the approximating surface of the other shows only the first beginning of caries. This phenomenon is difficult to account for unless we suppose that the teeth have different resisting powers.

In attempting to solve this question experimentally it seemed wise to me to begin with kinds of dentin which represented extremes in regard to density and amount of calcium salts which they contained. Those extremes were found in

ivory and in the dentin of the teeth of the sperm-whale.

The experiments carried out in the manner already described in the DENTAL COSMOS for 1903, page 697, gave the following results:

	Specific gravity.	Calcium salts.	Time required for decalcification.
Soft ivory ...	1.76	61.2	65 hours.
Hard " ...	1.84	63.4	96 "
Walrus	1.92	66.8	130 "
Sperm-whale.	2.08	72.7	336 "

seems to me to have been a mistake which caused me a great deal of labor without a corresponding return.

For the purpose of comparison I chose teeth from perfectly sound (immune) dentures and sound teeth from otherwise very imperfect, carious dentures, overlooking the fact that teeth from one and the same denture may show comparatively great differences in structure and composition, and that the isolated teeth which sometimes hold out after all their

FIG. 11.



Unequal caries of approximal surfaces in neighboring teeth.

We see here a striking difference in the resistance offered by different kinds of dentin to the action of acids—a difference, moreover, which corresponds to the differences in density and amount of calcium salts.

The important question now arises, Do similar differences exist in regard to human dentin from different teeth, and especially from teeth of different classes as regards "hard" and "soft" character.

A great difficulty exists in securing suitable material for those experiments, and in the beginning I made what now

neighbors have been swept away may have done so simply because of their superior constitution. In my subsequent experiments I accordingly chose teeth of the strong yellow type for comparison with young white or bluish white teeth which were already more or less carious. On the supposition that experiments of this kind, if they are to have any practical value, must be carried out under conditions as similar as possible to those existing in the mouth, I discarded the use of strong acids altogether, subjecting the teeth to such acids and in such strength

as are produced by the fermentation of various mixtures of saliva with food-stuffs.

Solutions and Mixtures.

The principal solutions and mixtures made use of are the following:

1. Bouillon, consisting of water 100, beef extract 1.5, peptone 1.5, sugar 2 to 3, neutralized, sterilized, and infected with saliva.

2. The same solution mixed with equal parts of saliva.

3. Saliva with 2 per cent. to 4 per cent. sugar.

4. Mixtures made by chewing up bread and meat, sometimes adding milk or beer, although the latter especially has proved undesirable on account of the yeast fungi which may be introduced thereby into the cultures and which prove very annoying.

The teeth—either whole teeth or halves or sections—were suspended in those solutions by means of silk threads so that they might be equally subjected to the action of the acid on all sides. The solutions were often changed, in some cases daily, and at first were kept in the incubator. After the fermentation had taken place they were kept mostly at room temperature, although in some cases they remained in the incubator throughout the experiment.

Great care must be taken to avoid contamination with molds, which consume the acid and finally convert the reaction into an alkaline one. If they have once established themselves there is nothing to be done but to take out the teeth, put them in 1 per cent. carbolic acid for from one to two days, and then begin the experiment anew.

The object of the experiments was to compare deciduous teeth and so-called soft teeth with hard teeth in regard to their susceptibility to the action of acid.

At first I hoped to be able to establish such a difference by means of the staining test. The sections after remaining some hours in the solutions were removed and treated with a solution of eosin in the expectation that those which had

been decalcified most would show a deeper staining. The results were, however, not sufficiently pronounced to admit of drawing any conclusions.

As the next step in this investigation ground sections of deciduous teeth and of hard and soft teeth were prepared, each 0.9 millimeter thick and suspended by silk threads in the fermenting solution. The time was then noted which was found necessary to soften (decalcify) the sections sufficiently to admit of piercing them with a needle. In all, seventy-five sections were treated in this way, with the result that in most cases no appreciable difference in the rapidity of the decalcification could be established; in a few cases only the hard sections evidently held out slightly longer than the soft ones.

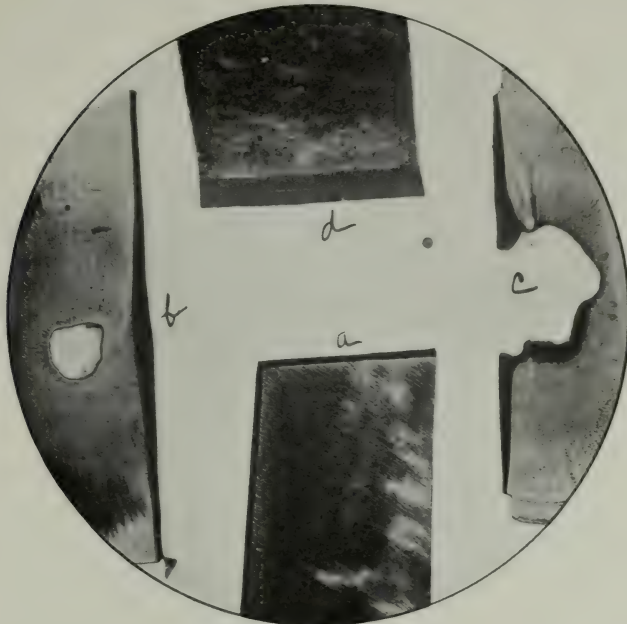
In following up this line of work, teeth of all three categories were halved or ground down from the surface sufficiently to expose the dentin and suspended in the solutions in the manner described. After the lapse of periods of time varying from a few days to several months corresponding teeth were taken out and sections ground, always holding the decalcified margin of the section to the front (against the stone) to prevent dragging off the softened tissue.

In Fig. 12 we have a photograph showing the effect of a weak acid solution on the dentin from teeth of the sperm-whale, *a*, dog, *b*, man, *c*, and elephant, *d*. The decalcified layer (black in the photograph) is seen to be very thin in the dentin of the sperm-whale and thickest in ivory.

Here again no difference approaching that found between ivory and dentin of the sperm-whale manifested itself, though in many cases a very appreciable difference did appear.

Fig. 13 shows us the result of a comparison in which a marked difference appears. In this case the tooth of a man who up to a very old age had been completely immune to caries was halved and compared with a carious soft first molar of a child of ten. We see here a very considerable difference in the thickness of the decalcified layers.

FIG. 12.



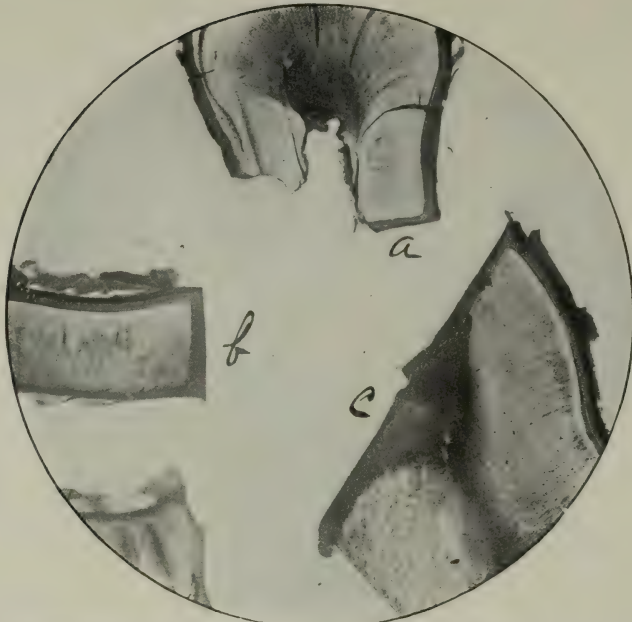
Unequal decalcification of different kinds of dentin under the same conditions.

FIG. 13.



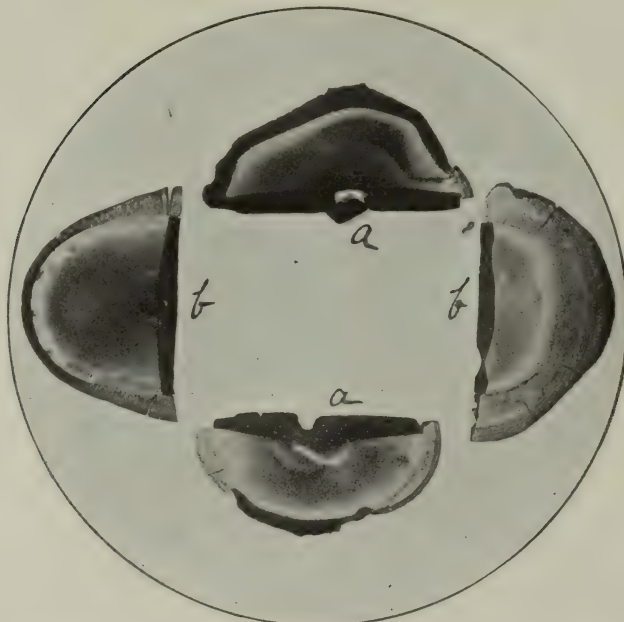
Unequal decalcification of tooth of an immune (*a*), and of a first molar of a child of ten; exposure, two months and eight days.

FIG. 14.



Unequal decalcification of hard (a), soft (b), and deciduous (c) teeth; thirteen days.

FIG. 15.



Unequal decalcification of dentin in solution 2 (see page 998); exposure, eight months.

In Fig. 14 we have a pronounced difference of hard dentin.

In Fig. 15 it will likewise be observed that the decalcification is considerably more extensive in the two pieces *a* than in *b*.

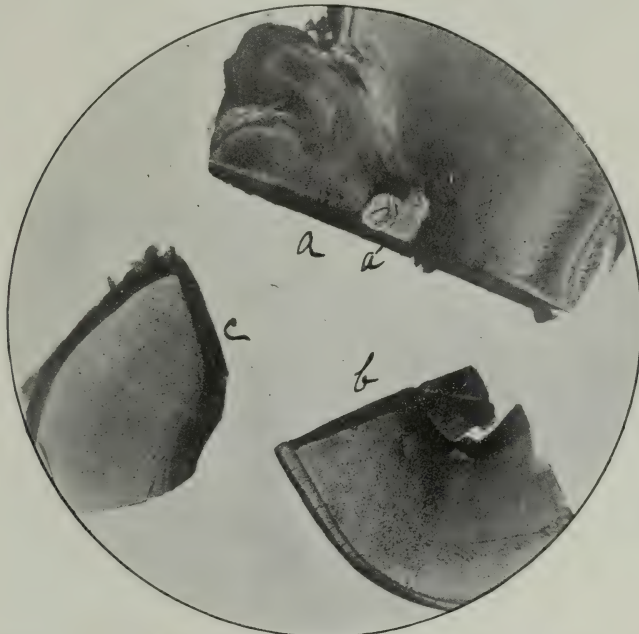
In this case solution 1 was diluted with an equal part of water in order to bring about a very slow action of the

deciduous tooth has held its own with the hard tooth, and in fact is slightly less acted upon, if anything.

Note the retarding action of the secondary dentin at *a*.

The result of all of my experiments has led me to the conclusion that there is a difference in the rapidity with which dentin from different teeth is acted upon

FIG. 16.



Comparison of tooth of an immune (*a*), with sound deciduous tooth (*b*), and soft tooth (*c*).

acid. It was thought that in this way any differences in the resisting power of the dentin might be made more prominent. The two sections *a* and *b*, in Fig. 15, are extremes chosen from eighteen cases.

In Fig. 16 I have reproduced the action of solution 4 on teeth hard (*a*), soft (*c*), and a sound deciduous tooth (*b*). We are here surprised to see that the

by weak acid under the same conditions, and that this difference will usually be found to be in favor of so-called hard dentin. The difference is not sufficiently great, however, to confer immunity upon the one tooth while the other falls a prey to caries. It is only one of the factors which, again, must not be completely lost sight of.

(To be continued.)

ORTHODONTIA.

By HORACE L. HOWE, D.M.D.

(Read before the Massachusetts State Dental Society at its annual meeting, Boston, June 1, 1904.)

ORTHODONTIA, Mr. President and ladies and gentlemen, has been treated by so many different men in so many different ways that I do not expect to give you anything new upon the

to our notice each year. Speaking from my own experience, I will say this: The more one studies malocclusion, the less extracting he will do for its correction. In order that perfect occlusion may be

FIG. 1.



subject tonight. Therefore I will simply show cases that I have treated by means of the intermaxillary elastics in connection with the so-called Angle expansion arch. Before concluding I will endeavor to show why I use this method.

In the treatment of malocclusion, normal occlusion should always be the aim of the orthodontist.

To obtain this condition—normal occlusion—it is needless to say that we must have every tooth present. The evils of extracting for the correction of irregularities seem to be more forcibly brought

impressed upon your minds throughout this paper, I will throw on the screen Fig. 1, which shows us a perfect type of normal occlusion.

Notice, if you please, that every tooth of the lower arch occludes mesially to, and lingually of, its corresponding fellow of the upper arch; the overbite of the upper teeth being permitted by the difference in the size of the arches, the upper arch being larger, and also by the difference in the width of the central teeth, the upper central teeth being one-third wider than the lower.

The lower teeth erupt first and serve as a guide over which the upper teeth are molded.

The first molars have been compared

appropriately calls distal occlusion. I will use this term throughout this paper, and it is this condition that I will try to express. To obtain normal occlusion in

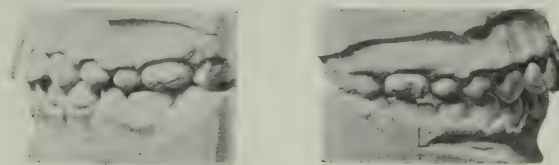
FIG. 2.



by Dr. E. O. Bogue to keystones of arches, being at the lowest points of the curves of the arches. If we extract these keystones the arches fall in. If these first

this case it was necessary to bring the lower jaw forward one occlusal plane; also to expand the upper arch, and this I did to the extent of one-half inch in the

FIG. 3.

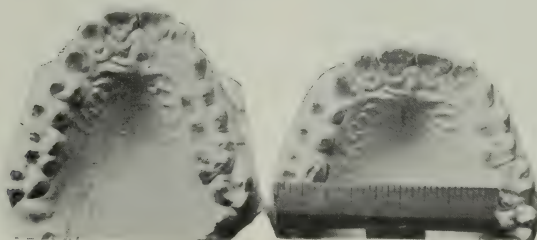


molars occlude perfectly we are sure that there will be no serious deformity distally of the first molars.

To sum up, each individual tooth has its relation to the arch that it is in, to the

region of the upper first molars. I was fortunate in having as the patient the young man who has kindly come here tonight that we may see his teeth as they are now.

FIG. 4.



function of the jaws as a whole, to respiration, and to facial expression.

Case I. (Fig. 2.) A young man fourteen years of age. Lower teeth occlude distally to the corresponding teeth of upper jaw instead of mesially. This condition of occlusion Dr. Angle very

Fig. 3 shows the mouth conditions at the end of three months. Notice, if you will, that all the teeth occlude in their proper relation to each other, but the occlusion has not settled.

Fig. 4 shows the palatal view of the same casts. I may say here that the

appliance was attached to the first molars, and in expanding the first molars the second molars also expanded.

regulated by another practitioner. The two first bicuspids were extracted, according to the universal method at that time.

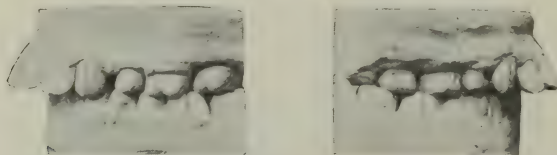
FIG. 5.



Fig. 5 shows the front and profile views before and after treatment, there being six months' difference in the time the pictures were taken. Notice, if you please, the change in expression; and I

The upper incisors were retracted, but owing to the too early removal of the retaining appliances they returned to their original positions. Meanwhile we can see what happened by Fig. 7. Upon our

FIG. 6.



think I can safely say that the expression will improve rather than grow worse.

Case II. (Fig. 6.) A young lady about twenty-four years of age. This case is interesting for several reasons. Six years previous to the time she came to me for treatment her teeth had been

left is a cast the young lady happened to have, it having been made at the time of the extraction of the two first bicuspids. The other cast shows the teeth six years afterward. We can readily see what has occurred. The arch has contracted at the first molar region one-

quarter of an inch; all of the back teeth have moved forward, so that the spaces obtained by extraction were nearly taken up. In the treatment of this case I

or as they have settled one year after treatment.

Fig. 10 shows the profile view before and after treatment. I think the differ-

FIG. 7.

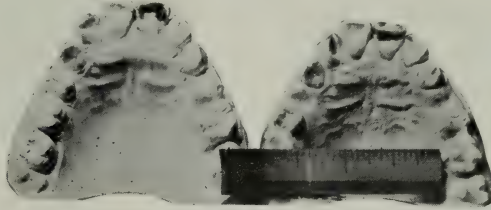


FIG. 8.

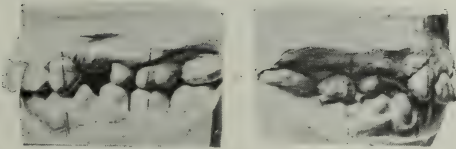


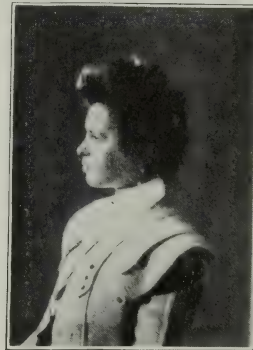
FIG. 9.



could pursue either of two methods: One would be to try to retract the upper teeth without changing the relation of the jaws. The other method would be to move the

ence in the expression of the young lady before and after treatment warrants my procedure, although many of you may think it very radical.

FIG. 10.



molar teeth back to their normal positions and insert bridges, and establish normal occlusion. I pursued the latter course.

Fig. 8 shows the casts ready for the bridges.

Fig. 9 shows the teeth as they are now,

Case III. (Fig. 11.) A case exhibiting normal occlusion upon one side and distal occlusion upon the other, with the result that there was present a decided irregularity of the incisors. In this case I did not adhere to the rule of non-extraction, but removed a first bicuspid

and carried the canine into its place, with the result that you will see in Fig. 12.

Case IV. (Fig. 13.) A case of extreme mesial occlusion, caused by finger-

but in the reversed order, with the result that you will see in Fig. 14.

Before concluding I wish to say a word regarding the appliance used. In all the

FIG. 11.

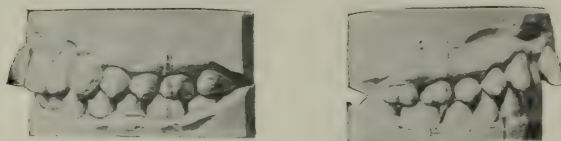
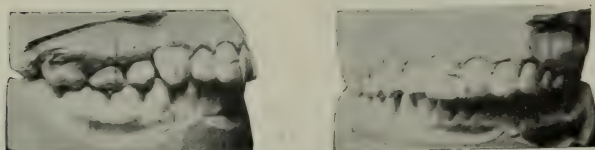


FIG. 12.



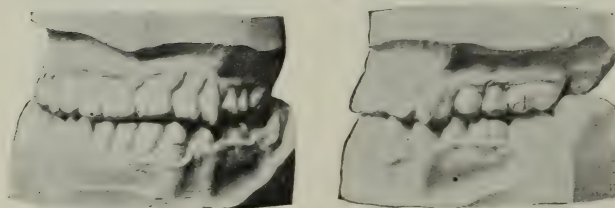
sucking. Age twenty-seven. Patient when young had the habit of sucking his fingers, with the tips back of the lower

cases that I have shown, with one exception, I used the intermaxillary elastics and the Angle expansion arch

FIG. 13.



FIG. 14.

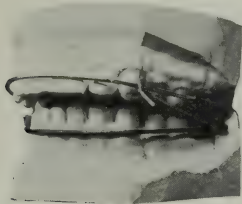


incisor teeth. The upper left canine occluded with the lower first molar, being two occlusal planes out of occlusion. The teeth of the upper arch occluded inside of the teeth of the lower arch, making the upper incisors one-quarter of an inch back of the lower incisors. In the treatment of this case I used the same intermaxillary force that I have spoken of,

Fig. 15 shows a typical case of protrusion and distal occlusion, with the appliances in position. Notice the elastics running from the lower appliance to the upper. These elastics tend to carry the upper teeth back at the same time that the lower jaw is brought forward. In cases of this kind in order to establish occlusion it is necessary that

the lower front teeth be depressed and the bicusps elevated. By tying the bi-

FIG. 15.

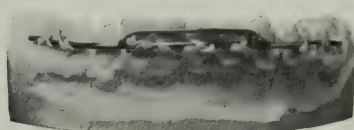


cusps to the expansion arch, having it quite low, then springing the arch up and tying the incisors, we have just the right action; the bicusps are elevated and the incisors depressed. In order to prevent tipping outward of the lower incisors I have used with good success a double band in front and tied to the lower band, as shown in Fig. 16.

This appliance with the elastics affords a means of treatment in cases where

extracting used to be thought the only means of treatment. No doubt the same result can be obtained by other methods, but with this appliance we employ to great advantage reciprocal force—so valuable in orthodontia. These elastics were first used with marked success by Dr. H. A. Baker, of this city, and could you all see the results obtained from

FIG. 16.



their use by Dr. Baker—as it has been my privilege to do—I am sure that you would be convinced of their value.

In conclusion, I thank you, ladies and gentlemen, for your kind attention.

THE IMPORTANCE AND CARE OF THE TEMPORARY TEETH.

By **GEORGE T. BAKER, D.D.S., Boston, Mass.**

(Read before the Massachusetts Dental Society at its annual meeting, Boston, June 1, 1904.)

THE importance of the temporary teeth, the value of their retention until shed naturally, and their relations to their permanent successors have long been understood. This is evident from the many articles that have appeared in dental literature from time to time, as well as from the pamphlets written to give information to parents and others with children in their care. With all this it is surprising how little is really known on the subject by people of education, who are well informed in other matters. It is to be feared that outside of the dental profession there is very little living knowledge on this subject, and that the information is mostly comprised within the covers of the books

in which it is written. It is a common thing to hear the remark, "Oh, it is only a first tooth," and how many people express surprise when advised of the necessity of filling and preserving the temporary teeth. It is also happily a matter of surprise to see how readily parents and others see and understand this necessity when the value of the temporary teeth is pointed out and explained.

About twenty-five years ago, Dr. J. W. White wrote a short treatise on "The Teeth, Natural and Artificial." This has been translated into French, German, and Spanish. It contains much that is valuable regarding the importance of the temporary teeth, but it is so hedged about with interesting matter concerning the

permanent and artificial teeth that its value to the general reader is liable to be overlooked and neglected.

On page 9 is found the following, which is so true and so well expressed that with your permission I will read it, though doubtless it is familiar to all present:

"The temporary teeth are smaller than the permanent, and of a less firm and solid texture; when, therefore, decay commences in the former, it proceeds more rapidly than in the latter, and for this reason the temporary teeth need more care than the permanent teeth. It is a common error that because they are temporary they do not require attention; or if any anxiety is felt about them, it is that they be not suffered to remain too long in the mouth, for fear that they may interfere with the eruption of their successors. This is a great mistake, for the regularity of the permanent teeth depends very much upon the retention of the first set until the second is ready to appear. The exemption of children from the suffering caused by decay of the teeth, and of the parent from consequent inconvenience, will also be best secured by constant attention to them from their first appearance. Moreover, the general health of the child will be promoted by keeping these organs in such condition that mastication can be performed without pain; otherwise the child will soon learn to avoid that which is inconvenient or painful, and by swallowing its food without proper mastication, will entail upon itself all the evils of indigestion."

Then follows about two pages of valuable suggestions regarding these teeth. I will quote but two sentences:

"If decay commences, the same care should be taken to prevent its extension as would be given to similar trouble in the permanent teeth. . . . The premature loss of the first teeth is the cause of much of the irregularity and consequent disfigurement of so many mouths; and when it is remembered how much is involved in this loss,—not only the ability to masticate the food and to enunciate correctly, but the comeliness of the face through

life—the importance of attention in season cannot fail to be appreciated."

In concluding the subject he says: "A good rule is to have a dentist examine the mouth, after the child is two and a half years old, at least twice a year, or oftener if necessary."

Now, that all this is not common knowledge among the people today is to a certain extent the fault of the dental profession. Had all done their duty in teaching the value of the temporary teeth from the time that Dr. White and others first pointed out their importance, fewer people of education would today show such glaring ignorance concerning the subject.

In the quotations above referred to many good reasons are given why (to use the words of Dr. White) "decay of the temporary teeth should receive the same care to prevent its extension as would be given to similar trouble in the permanent teeth." Of course, by "same care" is not meant that the teeth should be filled with a view to preserving them for the same length of time as though they were permanent teeth, but rather with a view to preserving all of them until such time as they shall be naturally shed. Plastics will answer much better than gold. Indeed, it may be said that the patience of the little one need never be taxed by the introduction of a gold filling in the temporary teeth. It is far better to depend upon plastics even should they need frequent renewal. It will not therefore be necessary to excavate the teeth with that degree of thoroughness as must be given the permanent, for the pulp, occupying a comparatively greater part of the tooth, would be more liable to be exposed, and the teeth, being more vital, have greater power of recuperative force.

In many cases, therefore, it will not be necessary to excavate and fill the cavity at all, but in a certain class of cavities (cervical for instance) the application of silver nitrate will inhibit the advance of caries to such an extent as to effectually save the tooth. It will certainly not be necessary to separate the teeth and make contour fillings in those approximal cav-

ities so common in the temporary molars. Gutta-percha, bridged over from one cavity to another, but pressing gently on the gum so as to exclude foreign substances, is far more easily inserted and affords a better masticatory surface, while assuring greater comfort.

If the pulp be found exposed, it is better to extirpate the main body (either with cocain locally applied, or under general anesthesia) and immediately fill the

were early introduced to a tooth-brush, which was faithfully used, and in addition frequent visits were made to the dental office for examination and cleansing. Result: The temporary teeth at five years of age are all in position and present a clean and wholesome appearance. Toothache to this patient is an unknown quantity.

The second cast (Fig. 2) represents the mouth of a boy whose parents failed

FIG. 1.

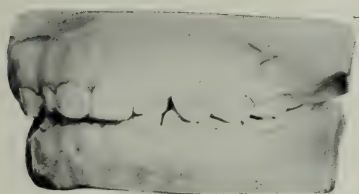
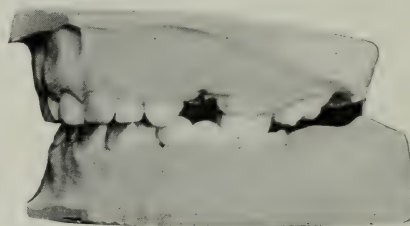


FIG. 2.



chamber with a mummifying and obtundent paste, and the cavity proper with gutta-percha or amalgam. In this and other ways that will suggest themselves to the resourceful operator the little patient, when successfully managed, need never have cause to dread the visit to the dentist, and the habit formed in early life will probably be a lasting one.

In conclusion, here are two casts representing the mouths of two boys aged respectively five and six. The first cast (Fig. 1) represents a mouth where the teeth received constant attention from the time of their first appearance. They

to appreciate the value of the temporary teeth, which were allowed to decay with no attention. Result: The little patient has always been a sufferer from toothache, several crowns have entirely crumbled away, and in his efforts to avoid sensitive cavities in mastication he has reached to find sound teeth to bite on until the occlusion is already faulty and a bad case of malocclusion with the permanent teeth when they appear is sure to follow. In passing around these casts I would ask that they be kept together, as it is the comparison of one with the other that is the interesting feature.

ITALIAN WRITERS ON DENTAL SCIENCE AND THEIR WORKS.

By CAV. DOTT. VINCENZO GUERINI, Naples, Italy.

(Read at the third general session—transferred from the Section on Education, Nomenclature, Literature, and History—of the Fourth International Dental Congress, at St. Louis, Mo., September 2, 1904.)

[AWARDED SPECIAL VOTE OF THANKS.]

IN Italy much more than elsewhere, up to a very recent period, dental art has been unjustly held in low esteem, and even in these later days nothing serious has been done in the way of dental teaching; it is therefore not to be wondered at, if in the history of dentistry Italian names figure in but scarce number as compared with those of French, German, English, and American authors. We shall see in the course of this paper that some great Italian dentists have acquired celebrity in foreign lands; for, precisely on account of the low esteem in which the profession was held among us, they abandoned Italy, despairing of ever being able to gain in their own country recognition and worthy appreciation of their talent.

In the greater number of works on general medicine and surgery, beginning with those written in Italy in the thirteenth century, one finds some chapter dedicated to dental maladies and their treatment; and while what we read in those authors may be of but little account taken by itself, nevertheless, from the point of view of the development of dental art, even that little merits consideration.

The first author worthy of mention is Bruno da Longobucco, surgeon of the school of Bologna. A treatise, written by him, toward the middle of the thirteenth century, was highly appreciated at the time of its appearance. The part relating to dental and gingival maladies is very brief. The author seems to be a great friend of the actual cautery, and advises using it as a cure for dental

caries, epulis, fistulæ, and cancer of the gums. Nothing is said by him of instrumental avulsion of the 'eeth; he recommends, instead, as a means of making a diseased tooth fall out, a paste of flour and the milky juice of the tithymal to be applied around its root.

The circumstance that Bruno da Longobucco, like other writers on surgery of the same period, does not mention extraction of the teeth, does not mean at all that this operation was not then in use, but only that instead of being practiced by surgeons, it was left to the so-called tooth-pullers, who generally belonged to the barber class. Indeed, in a still more ancient writer, the Arabian surgeon Abulcasis, one finds a passage to the effect that the extraction of teeth was very frequently practiced by barbers, and later (that is in the fourteenth century), the celebrated French surgeon Guy de Chauliac, in referring to dental maladies, wrote very explicitly that operations on the teeth were "particular," that is to say "special," and appertaining to barbers and "dentators."

Another ancient Italian surgeon, Guglielmo di Saliceto, who was professor at Bologna and at Verona in the second half of the thirteenth century, also says very little with regard to gingival and dental maladies, and absolutely nothing referring to surgical intervention upon those parts. For the treatment of swelling and other diseases of the gums he recommends friction with alum, mouth-washes of acetum scillæ, the application of mastic powder, and other medicaments of the same kind. To strengthen loose teeth

he advises using powdered coral mixed with mastic; and to effect the prompt cessation of toothache he recommends a compound of apium seeds, opium, and henbane, to be made into pills and applied to the diseased tooth.

Lanfranchi of Milan, one of the most celebrated surgeons of the thirteenth century, although he mentions the extraction of teeth in his treatise on surgery, shows himself but little inclined to the operation, and prefers to combat dental pains by using narcotics. The extraction of molars he considers an especially dangerous operation.

Teodorico Borgognoni (1205-1298), also known under the name of Teodorico of Cervia, is the first author who speaks of salivation consequent on mercurial frictions. What he says about gingival fistulæ, or fistulæ of the maxillary region in general, is also worthy of remark. He warns, that in every case of the kind it is necessary to pay special attention to the state of the dental roots; when there is exit of sanious pus the roots are certainly affected, and all the diseased teeth must then be extracted as quickly as possible.

Pietro di Argelata or della Cerlata, professor of surgery at Bologna in the fifteenth century, wrote a treatise on surgery in six books. In this work dental maladies are also taken into serious consideration. He speaks of a great number of dental instruments, which, however, are the same as those mentioned before him by the French surgeon Guy de Chauliac. Neither do his methods of cure present anything new, being for the most part identical with those of Avicenna and Abulcasis. He attaches great importance to cleanliness of the teeth, shows what serious injury is brought about by dental tartar, counsels its removal with scrapers, the file, and dentifrice powders, and even advises the use of aqua fortis for whitening the teeth.

He says nothing about the stopping of decayed teeth; he advises, however, cleansing carious cavities with aqua fortis or else enlarging them in such a manner as to render them less liable to become the receptacle of alimentary residues.

Pietro della Cerlata treated dental fistulæ with caustics and with arsenic. In cases of hard epulis of a malignant character he advises simple palliative treatment; in soft epulis of a benignant kind he was averse to excision, as likely to give rise to hemorrhage, and preferred instead tying the tumor, or else cauterizing it with boiling oil or other caustics, till it fell off.

Bartolomeo Montagnana, another illustrious surgeon of the fifteenth century, who taught in the University of Padua, recommended a mixture of camphor and opium as an excellent odontalgic remedy. About this time the faith placed in the eradicating virtues of certain substances was disappearing little by little, but on the other hand the important principle of conservative surgery, of which the ancients had been so jealous, began to fall into neglect, and the extraction of a tooth came gradually to be considered a thing of little moment, a thing that might be practiced with the greatest indifference. Montagnana himself considers the avulsion of a decayed tooth as the best means of cure, whilst the ancients only resorted to it as a last resource. Notwithstanding this, he gave preference rather to the use of chemical caustics and the red-hot iron than to extraction when the caries was not very deep.

Giovanni Plateario, professor at Pisa in the second half of the fifteenth century, cauterized decayed teeth with a lighted piece of the wood of the ash-tree, or with a red-hot iron; he held the cauterization to be much more efficacious if the carious cavity were previously filled with theriac. Before extracting a tooth, Plateario too, as was usual, administered purgatives or bled the patient.

He has the merit of having introduced the sitting position for operations on the teeth, whilst previous surgeons made the patient lie in a horizontal position or held his head steady between their knees, as we read of in Abulcasis and other authors. He recommends besides, when one intends extracting a tooth, to take care that the surrounding air be pure, perhaps fearing lest complications might

supervene through the entrance of contagious substances into the wound, when operating in places where the air was impure; or it may be that he held in mind, not without reason, that certain accidents, such as syncope or fainting, occurred more easily and were more dangerous in an impure atmosphere than in the midst of pure vivifying air.

Giovanni d'Arcoli, known also under the Latinized name of Arculanus, was professor at Bologna and at Padua in the fifteenth century; he wrote a medical work of great merit, and dedicated several chapters of the same to dental maladies, treating this subject with great thoroughness. He speaks, first of all, of the anatomy and physiology of the teeth, but runs into several errors—amongst others, on the number of the dental roots.

The following ten rules given by Giovanni d'Arcoli for the preservation of the teeth, and on which he lays great stress, form a sort of decalogue of dental hygiene:

(1) It is necessary to guard against the corrupting, within the stomach, of food and drink; one should therefore avoid all such aliments as easily spoil, and avoid after eating all that may perturb the digestion.

(2) One should avoid all that may produce vomiting.

(3) One should not eat sweets or viscous substances, such as dried figs, confectionery with honey, etc.

(4) One should not break hard things with the teeth.

(5) One should avoid all such food and drinks as set the teeth on edge.

(6) One should avoid aliments that are too hot or too cold, and especially the immediate passing from the one to the other extreme.

(7) One should not eat leeks; this vegetable has properties harmful to the teeth.

(8) One should remove all residues of food from the teeth immediately after each meal; and for this purpose should make use of small pieces of wood that are thin and very flat at the ends, but neither pointed nor sharp; the preference is given to twigs of cypress, aloe-wood, pine,

rosemary, juniper, and other bitter and astringent woods; one must take care, however, not to pick the dental interstices for too long a time, and not to injure the gums or loosen the teeth.

(9) After this one should wash the teeth, making use preferably of a vinous decoction of sage or a vinous decoction of cinnamon, mastic, cubebs, juniper seeds, root of cyperus, and rosemary leaves.

(10) Before going to bed, or else in the morning, fasting, one should rub the teeth with dentifrices adapted for this purpose. And he here notes that whilst moderate friction for a short time does much good to the teeth, strengthens the gums, impedes the formation of tartar, and renders the breath wholesome; on the other hand, friction that is too violent or continued for too long a time does harm to the teeth and predisposes them to various diseases.

Giovanni d'Arcoli distinguished three kinds of dental pains, namely, those depending on the gums, those depending on the substance of the tooth itself, and those depending on the dental nerve. He treats of the diagnosis of these different kinds of toothache, and in speaking of their treatment he says that when the cause of the pain resides in the gums, the extraction of the tooth is unnecessary—and indeed always harmful, for one has the loss of a tooth without obtaining the cessation of the pain; when the pain is seated in the tooth itself, extraction is sure to give relief; finally, when the dental nerve is the seat of the pain, it sometimes ceases on the removal of the tooth, at other times it does not.

In speaking of the stopping of decayed teeth, Giovanni d'Arcoli says that it must not always be carried out with the same substance, but that in making choice of the material, one should have regard to the temperament of the individual and to the condition of the gums and of the tooth. However, that which is most particularly noteworthy is the fact that Giovanni d'Arcoli counsels filling the teeth, in certain cases, with gold leaf.

The use of gold in dental stoppings, therefore, dates back, at least, to A.D. 1450, the period at which Giovanni d'Ar-

coli's book was written. It is, moreover, to be noted that in naming this mode of stopping he does not speak of it as an innovation introduced by him; indeed he merely alludes to it in the briefest possible terms, in marked contrast with the ample and particularized manner in which every other subject is treated in the book. From this we may argue that gold stoppings were already in use before the time in which Arculanus wrote, and that he simply mentions a practice of the dentists of the time. When we reflect, again, that Arculanus falls into grave error when speaking of the number of roots of the various teeth, it becomes evident that he could not have possessed any practical knowledge of dental art.

Even at that time the art was practiced by specialists, as the passage of Guy de Chauliac quoted above clearly proves—in saying that dental operations appertain to barbers and “dentators”—and one may undoubtedly deduce from that author's own work, wherein the various dental operations are spoken of and a great number of instruments for the carrying out of them are named, that the dentators or dentists of that time were not simply tooth-pullers.

The cases in which the extraction of a tooth is indicated are, according to Giovanni d'Arcoli—(1) When the pain is persistent after all other means of cure have been tried. (2) When there is danger of the disease being communicated to the neighboring teeth. (3) When the tooth is a hindrance to speech or to mastication.

It is also to be noted that in Giovanni d'Arcoli's book we find the first mention of the instrument called the “pelican,” which remained in use for so long a time, undergoing a great number of modifications, and finally giving origin to the key of Frère Côme, the key of Garengéot, and the English key.

Another circumstance, however, renders Giovanni d'Arcoli's book of still greater importance for the history of dentistry. One hundred years after the date at which this author wrote, the German surgeon Walther Hermann Ryff published a pamphlet in which, for the first

time, dental maladies, their prophylaxis and treatment, are dealt with independently of general medicine and surgery. Ryff is therefore considered as the initiator of dental literature properly so called, and his book, of which the copies now extant are exceedingly rare, has been the object of accurate study, especially on the part of Dr. Geist-Jacobi, who has made known to the dental world the contents of this old pamphlet, bestowing on its author the highest praise. Now, by comparing all the passages of Ryff's book made known by Geist-Jacobi with Giovanni d'Arcoli's work, I have been able to establish that it contains absolutely nothing original, for all that is worthy of note in it has been translated *ad litteram* from the work of the above named Italian author, written a hundred years before!

The celebrated surgeon Giovanni da Vigo (1460-1520) wrote an excellent treatise on general surgery, in which the part relating to dental and gingival affections is treated briefly, but in substance better than by preceding authors, for many useless and even ridiculous things current are by him passed over in silence altogether, and only practically useful methods of treatment are spoken of, and in a clear and simple manner. Thus, in what relates to the treatment of caries, he only remarks that “The decayed part of the tooth must be entirely removed by means of a drill, a scalpel, or other proper instrument, and then, to preserve the tooth, the carious cavity must be filled with gold leaf.”

Many Italian anatomists of the sixteenth century studied the anatomy and embryology of the teeth very carefully, thus contributing most importantly to the progress of dental science.

Gian Filippo Ingrassia (1510-1580) was perhaps the first to make researches into the development of the teeth, and to discover the germs from which they are derived.

Matteo Realdo Colombo of Cremona, the successor of Vesalius in the chair of anatomy at Padua, combated the erroneous belief that the teeth form in the alveoli only a short time before their erup-

tion. Having dissected the jaws of a great many fœti, he always observed that the teeth existed in them already, for which reason he was able to affirm with all certainty that the teeth begin to develop during intra-uterine life.

The highly celebrated anatomist Gabriel Fallopius (1523-1562) of Modena made accurate and very happy researches about the development of the teeth; he published the results of his studies in a book, "*Observationes anatomicæ*," published at Venice in the year 1562, the same year in which he died.

By his investigations he demonstrated the fallacy of Vesalius' opinion that the permanent teeth develop from the roots of the deciduous ones. He was also the first to speak in clear terms of the dental follicle. "The teeth," says Fallopius, "are generated in two periods of time, the first in the womb, after the formation of the jaws, and the second in the extra-uterine life, before the seventh year. At the time of birth, the first teeth are still imperfect, without roots, completely inclosed within the alveoli, and constituted of two parts, one osseous and hard, the other soft. In fact, the surface by which they erupt is hard and concave, the other part, instead, is soft and damp, and wrapped round with a tender membrane. Little by little, however, this soft part becomes bony and forms the root of the tooth."

Fallopius refers to having observed that the permanent teeth originate in the following manner: "A membranous follicle forms within the bone; this follicle is provided with two apexes, one deeper, to which is appended a small nerve, a small artery and a small vein; the other apex, more superficial, is prolonged by a thread or small cord like a tail. This cord reaches to the gum, passing through a very narrow foramen in the bone. Inside the follicle a special white substance is formed, and afterward from this the tooth itself, which at first is bony only in the part nearest to the superficies whilst the lower part is still soft, precisely in the same way as has been described for the deciduous teeth. Each tooth comes forth making its way

through and dilating the narrow foramen through which the *tail* of the follicle passes; and this holds good for the deciduous as well as for the permanent teeth."

Fallopius also had the merit of having called attention to the analogy existing between the development of the teeth and of the feathers of birds, thus being beforehand with Duverney, who demonstrated a century later that the teeth have in their mode of development a great analogy with all epidermic appendages (nails, hair, feathers, horns).

Another celebrated anatomist of the sixteenth century, Bartolomeo Eustachio, made long and most accurate research on the teeth and on their development, and in 1563 published a work entitled "*Libellus de dentibus*" (little book on the teeth), which is from every point of view a masterpiece, and marks a notable progress in the anatomy, the physiology, and the embryology of the dental system.

The high value of Eustachio's researches has induced a French surgeon to perpetrate a plagiarism, a fact which so far as I know has never been unmasked, but which I myself have had occasion to examine. The name of Urbain Hémard has a certain celebrity in the history of dental art, as being that of the author of the oldest dental monograph published in France. It appeared in 1582, that is about twenty years after Eustachio's book, and bears the title, "*Recherche de la vraye anathomie des dents, nature et proprieté d'icelles, où est amplement discours de ce qu'elles ont plus que les autres os; avecques les maladies qui leur adviennent et les remèdes.*" Now, by comparing Urbain Hémard's book with that of Eustachio, I have found undoubted proof that Hémard, instead of carrying out researches of his own on dental anatomy, as he wants us to understand, merely translated, and for the most part literally, the most important portions of Eustachio's book.

This fact, which is very similar to the other already related with reference to Giovanni d'Arcoli and the German surgeon Ryff, demonstrates the great esteem which the Italian authors enjoyed at that

time, as well as the great influence they exercised on the early period of the development of dental science.

The celebrated Fabrizio da Acquapendente (1537-1619) in a treatise on surgery speaks of the affections of the dental system succinctly, but with great order and clearness, thus enabling us to form a precise idea of the state of dental surgery toward the end of the sixteenth century.

According to this author the principal dental operations are—(1) The forcible opening of the dental arches in cases of continued constriction of the same, in order to prevent the patient dying of hunger. (2) The cleaning of the teeth. (3) The medicating of carious cavities. (4) The filling of carious cavities with gold leaf. (5) The resection of teeth that have erupted in abnormal positions. (6) The planing down of unevenness, or dental spikes. (7) Extraction.

He speaks briefly of all these operations and also alludes to dental prosthesis and palatine obturators, and further enlarges upon gingival maladies and the mode of treating them.

In an excellent work on the anatomy of the bones, published in Rome in 1689, Domenico Gagliardi treats very ably both the anatomy of the teeth and also the structure of the several parts of which these organs consist. He considers the enamel as formed by parallel fibers which during the period of formation secrete a concretable juice, *sui generis*, that acquires a consistence much greater than that of the bones. He also says that he has succeeded in extracting sparks from teeth by rubbing them hard together, or better still with a steel.

Amongst the Italian authors on dentistry who wrote in the eighteenth century, Guiseppe Lavini and Antonio Campani deserve particular mention.

Lavini published at Florence, in the year 1740, a very good work entitled "Trattato sopra la qualità dei denti, col modo di cavarli, mantenerli e fortificarli."* Campani wrote another treatise

on dentistry, "Odontologia ossia Trattato sopra i denti."* This work was also published in Florence, in the year 1786, in a very elegant edition and illustrated with thirty-six tables very neatly presented. It must, however, be confessed that these two books, although published posterior to Fouchard's classical work, do not in the least show progress—in fact they are inferior to it in several respects.

In the first half of the nineteenth century, the dentists who published writings of any value were few. The only authors who seem to me worthy of mention are—Vittorio Cornelio, who published between 1813 and 1821 several writings on caries and other dental subjects, and besides these some statistical studies on dental maladies in Piedmont; C. Tagliaferro, who published at Turin in 1814 a short treatise on odontology; L. Fattori, who was the first (1825) to counsel the use of the trepan as a means of destroying the dental nerve in many cases of caries, whilst previously to this, recourse had generally been had to the red-hot iron or the chemical caustics. Fattori published at Florence a good treatise on dentistry that went through several editions, the last of which bears the date 1843.

In the latter half of the nineteenth century, and especially during the last twenty years, dental publications gradually increased in number. However, I prefer not to enter into these, because, as for the most part they issue from the pen of living Italian authors, my judgments might perhaps be suspected of partiality.

I will now terminate this brief review by alluding to some Italian dentists who gained a high reputation abroad, and who became the authors of notable works on dentistry in the language of the country where each respectively had taken up his abode.

One of these dentists was Bartolomeo Ruspini, who exercised the profession in London with great success for above thirty years. He was patronized by all the greatest personages of the kingdom,

* "A treatise on the quality of the teeth, with the mode of extracting, maintaining, and fortifying them."

* "Odontology, or a Treatise on the teeth."

and also by the royal family, from whom he received special marks of distinction. He acquired so conspicuous a position that he was able, with the product of his work, to found an orphanage that was called by his name, being moved to do this by his great love for children, whose dental maladies and disorders had always been objects of particular study for him during his lifetime. In 1768 he published "A Treatise on the Teeth, their Structure and Various Diseases." This book was remarkably well received and went through a number of editions, the last in the year 1797. Ruspini did not, in reality, contribute very much to the development of dental science. He is, however, to be specially remembered as the inventor of a very good mouth-mirror, a means of examination which afterward gradually came into general use.

Another Italian, Ricci, acquired great celebrity at Paris, where he practiced the profession at the end of the eighteenth and beginning of the nineteenth centuries. He introduced notable improvements into the manner of inserting pivot teeth, into the construction of springs for artificial dentures, and into other parts of odontotechny. He was also the author of several works, the most important of which was his "Principes d'Odontotechnique," published in 1790.

The Italian dentist Maggiolo, in collaboration with the French physician Jourdan, published a work of considerable merit at Nancy in 1807, entitled "Manuel de l'Art du Dentiste." This book, written for the most part by Maggiolo, is almost entirely dedicated to dental prosthesis, which subject had never been treated in a detailed manner by anyone before him; Maggiolo's work may therefore be considered as the first of its kind. The book was intended to serve as a practical guide to students of dental art, principally in all that relates to prosthesis; and it must without doubt have been of the greatest utility, from the clear, precise, and complete manner in which dental prosthesis is therein treated. According to Professor Lemerle, of the Dental School of Paris, Maggiolo was the first *prothésiste* of his time, and his book

gave a powerful impulse to the progress of dental prosthesis.

Amongst the Italian dentists who exercised the profession in other countries, the name that takes first rank in the history of dentistry is that of Fonzi, for he, as is well known, had a most important share in the invention of mineral teeth, which invention is generally attributed to Dubois de Chemant, although some consider him a plagiarist and maintain the chemist Duchateau to be the real inventor; others, finally, declaring that both of these were merely precursors of Fonzi, to whom the credit is practically due. Impartial justice, however, obliges us to say that this important invention is due not to one alone, but to all three of these men. The fact is that Duchateau was undoubtedly the first who had the idea of making porcelain dentures, and Dubois de Chemant first succeeded in putting the idea into practice; but the prosthetic pieces of his making were in one sole block of porcelain representing at the same time the teeth and the gums. Fonzi, finally, manufactured mineral teeth properly so called—that is, separate teeth intended to be fixed on metallic bases. Dubois de Chemant's system of manufacture was as inferior to that of Fonzi as printing by means of wooden blocks as compared with movable types. Whilst Dubois de Chemant only made dentures for given individuals, Fonzi manufactured, as is done at the present day, assortments of mineral teeth with which dentures could be constructed for anyone and everyone.

These teeth were furnished with small clamps of platina, inserted in the mineral paste before it was baked, and by means of which the teeth could be soldered to the metallic base. No one had conceived the idea of manufacturing teeth of this kind before Fonzi. Besides this, he discovered how to imitate the semi-transparency peculiar to human teeth, and to give a great variety of shades to the paste, so as to be able to make the mineral teeth harmonize in color with the natural teeth of the various individuals. In fact, Fonzi introduced enormous improvements into dental prosthesis, as we

learn from his own writings and as was fully recognized by the Académie de Médecine, and by the Athénée des Arts of Paris, which latter body conferred on him a medal and a crown in recognition of his high merits.

I have here essayed to prove, and I hope successfully, that notwithstanding the relative poverty of her dental literature, Italy has largely contributed to the development of dental art and science.

Three names alone, of those cited by me, are sufficient to prove this: that of Giovanni d'Arcoli, the first author who speaks of gold fillings; that of Eustachio, whose excellent treatise on the anatomy of the teeth represents a record in the history of dental science; and that of Fonzi, who, as we have just seen, was the first to manufacture mineral teeth to be mounted on metallic bases.

NECROSIS.

By JAMES E. POWER, D.M.D., Providence, R. I.

(Read before the Massachusetts Dental Society, at its annual meeting, Boston, June 1, 1904.)

THE tissues of the body are capable of existing and performing their functions only for a certain length of time. Their power of renewal grows less as age advances, and finally their resisting powers are no longer capable of impeding rapidly advancing degeneration. Then we have that suspension of function which is known as death. Life ceases with the gradual destruction of the functions of the different organs. Destruction of the functions of the heart, lungs, or nervous system causes death in a very short time.

After destruction of the functions of the intestinal canal, of the liver, or kidneys, the organs are just as surely deprived of life, but some time may elapse before death may take place.

In contradistinction to this general death there is a local death of a part of single cells or group of cells. This is known as "necrosis." In some forms of this local death the pathological changes take place so gradually that even microscopic investigation cannot detect them and decide just when the cells cease to live.

Tissues which exercise special functions will die more quickly than those

which do not exercise such functions, as experiments have shown that by arresting the blood current the brain, renal, and intestinal epithelium will die in two hours, while skin, bone, and connective tissue will live twelve hours.

CHARACTERISTICS OF NECROSIS.

Pathological conditions leading to necrosis may originate in the periosteum, developing such interference with the circulation as to cause death of the part by reason of the extension of the periosteum into the alveoli, forming the alveolo-dental membrane. Suppurative bacteria invade these cavities, causing looseness of the teeth, and if this inflammatory process be not arrested the plastic substances between the bones become rapidly converted into pus; then follow separation of the periosteum from the bone and destruction of the blood supply, when we get the condition known as necrosis.

The term necrosis when used in its proper sense refers to the process of death—the sum-total of the active causes which eventually bring about the death of a portion of the skeleton, osseous or cartilaginous. The degree of injury,

idiopathic or traumatic, required to cause the death of bone is less than that required to disintegrate soft tissues. This is probably due to the anatomical construction of the parts. Necrosis is a condition, or rather the result of inflammatory conditions of bone.

The same conditions which exist in inflammation of the soft parts are present in bone inflammation, but here they terminate more quickly, because the tissues in the soft parts will undergo changes to accommodate the bloodvessels. This is not the case in bone, since the Haversian canals are completely filled with bloodvessels, and the cell structure is packed entirely around them, so that surplus space does not exist. When the blood is forced through these vessels, which are already taxed, the vessels have not the power to accommodate themselves to this new and sudden demand. The bone tissues will not expand, and the result is that the vessels become choked. Then comes a condition of stasis, a retarded circulation, and finally the supply to the part is cut off, and death ensues.

We know that the chief supply of blood is from the superficial layers of the bone, and when these are lifted away by accident, the supply is again cut off and this same condition follows. The parts must be nourished, and any interference with this condition will cause necrosis if not arrested in time. The causes that may bring about this condition are very numerous, but the pathology remains always the same. The only variation is in the intensity and the rapidity of the process.

Irritation is always present in necrosis. It may be mechanical irritation, as in the case of a fracture badly treated or an impacted or malposed third molar. It may be chemical irritation, which acts by virtue of its chemical reaction when applied to the tissues, such as arsenic, phosphorus, mercury, etc. It may be a septic irritant inducing the formation of poisons, or the introduction of such poisons themselves. I have seen and treated several cases of this class where local anesthetics and presumably unclean hypodermic syringes were used.

Necrosis is more frequent in the mandible than in the maxilla, probably due to the difference of bone structure. Also the circulatory system is much more extensive in the maxilla than in the mandible. Bone is replaced by the process of repair in the mandible, while in the maxilla the space produced by necrosis is filled up with strong fibrous tissue.

As soon as the vitality of bone becomes extinct it becomes a foreign body, and in the natural order of things the system tries to expel it. The surrounding tissues, however, prevent this from taking place, and we get only a separation. This condition, if allowed to remain, will cause frictional irritation and will cause the inflammatory conditions to repeat themselves, when more necrotic bone is produced unless surgical interference be resorted to.

Necrosed bone is generally separated from the living bone. This separated area is known as the sequestrum. It is held by the adjacent tissue, and while new bone generally forms beneath it, yet I have observed a case where the new bone formed entirely around the sequestrum.

Among the causes of this disease are recent injury, irritation from diseased teeth, badly treated fractures, badly treated teeth, malposed or mal-erupted teeth, tuberculosis, syphilis, excessive use of mercury, phosphorus, and arsenic; fevers in children, and feebleness in old age. The principal kinds, however, which come under our observation are syphilitic, arsenical, and septic, the latter generally caused either by foreign bodies or unclean instruments.

PHOSPHOR-NECROSIS.

Phosphor-necrosis was first observed about 1838, soon after the introduction of the manufacture of phosphorus matches, but of recent years we seldom find persons affected by it. This is due to the knowledge of the toxic action of the drug, and the precautions taken to ward against its evil effects. The part attacked is generally the mandible, but record shows that the vomer, sphenoid,

and basilar process of the occipital have been affected, and in the latter cases the result is generally fatal.

How the phosphorus acts is an obscure question, some claiming that it is the arsenic present that is the cause of the trouble; while Hirt, Mears, and Wagner have advanced plausible theories and observed facts which have helped to decrease the frequency of the malady.

This kind of necrosis manifests itself by pain and inflammation of the gum. If the tooth be extracted, pus will follow, and each tooth will loosen and fall out until the disease comes to a standstill. A very foul-smelling pus flows constantly from the edges of the mucous membrane, and on close examination the odor of phosphorus will be detected.

It is also distinguishable from other forms by the pain, which is at first intermittent, but finally becomes deeply seated and constant. Swelling is more marked; the soft tissues being infiltrated and puffy to a degree not noticeable in other forms of necrosis. Careful inquiry as to probable cause, study of the history, and examination of the cavity of the mouth will lead to a diagnosis.

In the treatment of this disease, gargles, mouth-washes, tonics, and a general restoration of the physical condition of the individual is advised; fresh air, moderate exercise, etc. The surgical treatment in these cases should be delayed, as the slightest injury to the tissues of a person thus affected will cause serious complications.

SYPHILITIC NECROSIS.

The same diagnostic signs that characterize other forms of necrosis may be present in syphilitic necrosis, and we are obliged to rely on the history as well as the physical condition of the patient. In consideration of these obligations we must insist upon the patient answering truthfully the questions we ask. My experience has taught me that a very large percentage of persons thus afflicted will deliberately misstate their case. Their ability to inspire confidence by their apparent sincerity and solemnity

of manner is as amazing as it may prove serious. This is probably due to their lack of moral courage to acknowledge their condition.

Syphilitic necrosis may appear at almost any age, probably more often after twenty-one years of age, although only a short time ago I was consultant in a case where a child nine months old had a well-developed case of syphilitic necrosis of the mandible extending along its whole border. Another interesting case which I had the good fortune to observe was that of a man about fifty years of age, who acquired syphilis, which caused a perforation of the hard palate about the size of a ten-cent piece; after removal of the bone the tissue closed over the opening, and examination a year later showed everything to be normal. I have seen several cases of syphilitic perforation of the hard palate, but this is the first case where I have seen the tissues close over and where the patient did not have to wear a plate.

This appears more often in the upper than in the lower jaw, although I have seen a case of syphilitic necrosis of the mandible extending from the symphysis to the angle. This patient was infected about twelve years ago, and instead of continuing treatment for three years he was discharged as cured after six months' treatment, everything being apparently normal until the second outbreak of the disease.

The treatment of this disease is first constitutional, second prophylactic, and third surgical.

ARSENICAL NECROSIS.

This is caused by the chemical action of the drug when applied to living tissue, and is probably the one form which comes under the observation of the general practitioner of dentistry more often than any other; hence we should all know how to prevent its occurrence, how to recognize its presence, and how to treat the conditions when found.

The first symptoms of this form of necrosis are a dull, steady pain, not very severe but, as the patient will express it,

annoying, and an inclination to grind the teeth. Examination will show a highly inflamed condition, very sensitive, and in the first stages a bright red line around the border of the inflamed area. As time elapses it assumes a grayish white color, and the tooth becomes sore; then it becomes very loose; the condition spreads from one tooth to the other until the whole jaw is affected, and in cases of longer duration the patient becomes feverish and delirious and loses his appetite.

Arsenical necrosis is generally the result of the drug escaping from the cavity of a tooth when applied for devitalizing purposes, although I have one case where it was caused by the patient using colored yarn to remove particles of food from the interstices of the teeth. In this case it extended from one angle to the other.

I have treated a great many cases of this form of necrosis and most of them have been confined to a very limited area, although two were quite extensive (reported in the *International Dental Journal*, November 1902).

The treatment of necrosis in general should be both constitutional and surgical. The first step is the removal of the cause, whether predisposing or exciting.

In syphilitic and phosphor-necrosis, constitutional treatment should be given before surgical treatment is resorted to. In all other forms it is my custom to operate immediately, and in a large number of cases I do not wait for the sequestrum to form, the conditions of the individual case, however, governing this. I also keep the bowels free by the use of cathartics, thereby eliminating any toxic elements which may develop in the alimentary tract. The free movement of the bowels will also draw the blood away from the inflamed part and give much

relief to the patient. I advise keeping the patient in bed for at least twenty-four hours after operation, as rest is a very important consideration in assisting nature to restore the part to its normal condition.

Sinuses are generally present in neglected cases, and experience has taught me that such sinuses should not be exclusively used as guides. If so used they will prevent us from reaching the seat of the trouble, and if we do not do that we cannot effect a cure.

I have had some cases where the introduction of a probe into the sinus would not disclose the existing condition. So it is customary with me to extend such sinuses, or to cut deeply into the tissue and some distance from the apparent center of the trouble. In one case the trouble was at the socket of the third molar. The sinus was opposite the second bicuspid, and in this instance the probe when introduced would cause one to think that the focus was at the first molar, as at this point the probe would come in contact with the bone, and could not be forced any farther. We are taught that pus will flow in the line of least resistance, but I feel that this rule, while true, is somewhat misleading; to thoroughly interpret its meaning we should add that the line of least resistance will vary in every case, and sometimes in direct opposition to all rules of surgery or physics.

Operation for necrosis of the jaw should be carried out, when possible, from the inside of the mouth. In cases where external incision must be made, give the patient the consideration justly demanded; make your incisions as you would have them made on your own face, and you will make them where they will be least noticeable, cutting into the lines which already exist on the face.

PROCEEDINGS OF SOCIETIES.

FOURTH INTERNATIONAL DENTAL CONGRESS, ST. LOUIS, MO.,
AUGUST 29 TO SEPTEMBER 3, 1904.

Second General Session—Tuesday, August 30th.

THE second general session was called to order at 10 o'clock Tuesday morning by the president, Dr. H. J. Burkhardt.

THE PRESIDENT. The first paper of the program this morning is one reported from Dr. Brophy's section, entitled "*A propos of a Portrait of Pierre Fauchard*," by Dr. George Viau of Paris, France, which will be read by Dr. Brophy.

Dr. John E. Grevers, Amsterdam, Holland, honorary president, was called upon to occupy the chair during the reading of Dr. Viau's paper.

Dr. BROPHY, before reading the paper, made the following remarks:

Mr. President, ladies and gentlemen: I have a letter from the author of this paper informing me that he has forwarded to this place a large oil portrait of the distinguished Frenchman whose memory we all revere, and it is to be placed upon the stage. It has not yet arrived, however, and in the meantime I have placed this one before you [exhibiting portrait] in order that we may have his likeness before us during the reading of the paper. As the president announced, the paper is by Dr. GEORGE VIAU, professor in l'École Dentaire de Paris:

A PROPOS OF A PORTRAIT OF PIERRE FAUCHARD.

There are certain names which, so to speak, represent either an epoch, a science, or an art. To dentistry that of Pierre Fauchard is one of these epoch-making names.

There were many dentists before him,

and the city of Paris as early as 1700 had already established regulations by virtue of which no one was allowed to practice without having obtained a certificate as being an expert dentist, which certificate was granted after the candidate had submitted to an examination before a commission of three surgeons appointed by the municipality. But the subject of this examination included such extraordinary theories and such brutal practices that the art of dentistry was relegated to the lowest type of surgeons, who were looked down upon as practicing an art very inferior to medicine.

Pierre Fauchard, in eliminating from our profession a quantity of absurd practices, in relying only upon well-observed clinical facts for his technique, in knowing how to draw logical deductions from these—in one word, in being in advance of his time by the introduction into our art of the experimental method—could have completely transformed the dentist's art of his period, had he had more pupils and had the teaching of his books broken down the formidable barrier which at that time opposed all progress. Nevertheless, his influence, though less than it ought to have been, was not null, and his work continued to be one of the principal foundations upon which was built the variety of information now required of the educated and experienced practitioner.

We therefore, no matter to what nation we may belong, can look upon him as a precursor of our present advanced methods.

Humanity honors itself by commemorating and glorifying those who have aided by their energy and genius to pass the hard stages of ancient times, when all progress was considered as an attempt against the existing order of things, consecrated by superstitions and time-honored traditions.

Pierre Fauchard, whose début in life was most difficult, but who, in spite of all, succeeded even during his lifetime in arriving at prominence, was an energetic worker, and we can but honor ourselves in preserving his memory, for he was the greatest among those who have traced the path which we are now treading.

My much-regretted friend, Dr. Louis Thomas, librarian of the Faculty of Medicine of Paris, at a conference on the occasion of the inauguration of the Dental School of Paris in 1880, by learned research resuscitated for us, so to speak, the great figure of our illustrious colleague.

Born in Brittany toward the end of the seventeenth century, and destined by his parents for the practice of surgery, Fauchard was at first prevented by family troubles from following his vocation; but Providence took care that he should not escape the destiny of a master in one of the branches of the art of healing.

In organizing the navy, Colbert instituted a health service. This was not strict in its entrance requirements, and it was thus that Fauchard, after having unsuccessfully tried several mechanical professions—the practice of which, however, proved to be not without value to him later on—was able to enter, as assistant, one of these services. He there had the good fortune to have as his chief Alexandre Poteleret, surgeon-major of the king's navy, who has especially interested himself in affections of the mouth, and more especially in scorbutic disorders, which at that time were frequent on sailing vessels making long cruises. This happy chance decided the future of Pierre Fauchard, who was already interested in the little he had been able to learn of this specialty, and more particularly in all that his ingenious mind suspected was yet to be discovered therein. His service in the marine corps

did not continue long, and in 1700 he took up residence in the university town of Angers.

At this period the dentist's services were little in demand, and it was necessary for the few existing practitioners to travel from town to town in order to make a livelihood. Owing principally to this, and also to his now growing notoriety, Fauchard visited at fixed dates the cities of Tours, Rennes, and Nantes; later he traveled as far as Paris.

At first acting as dentist to the needy population, as the remarks in his book prove, he gradually succeeded in securing a more select and lucrative *clientèle*. The boldness of the practitioner increased according to his social elevation. At first he only attempted the cleaning and extraction of teeth; later on he practiced trephining, cauterization of the pulp, and even transplantation from one mouth to another.

He acquired fame, and people came to seek him from the depths of Brittany. He determined to test his success on a larger scale, and in 1719 moved to Paris.

The most renowned dentist of the town was Carméline, the king's dentist, and of him he made a friend. He also made friends in the College of Surgery, in the Faculty of Medicine, and even amongst the doctors of the court. Two years later he counted amongst his patients some men of standing. De Jussieu, Louis Petit, Hévétiüs, La Peyronnie, Hecquet, professors of the Faculty or illustrious doctors, held him in such high esteem that they recommended their patients to him and even consulted him in certain cases pertaining to his specialty.

His success and the experience he had acquired incited him to the desire, common to all, that his name should survive by making his successors benefit by the knowledge of a science and of an art he had renewed or created, for before his time there was no book worthy of such a name.

It was in 1723 that the first edition of his treatise appeared in French, and it was read and commented upon even abroad. In 1736 it was translated into German. This incident gives an idea

of its importance, as the pedantic doctors beyond the Rhine up to that time accepted only works written in Latin. From the date of the publication of his book the Breton dentist acquired a scientific standing which he had not previously enjoyed, and a recognition which might, at that time, be considered universal. This position could not be weakened even by the bitter controversy that Croissant de Garengot, a studious man, disdainful of those whose reputation sprang rather through quick-wittedness, carried on unequally against him.

In 1746 the second edition of his work appeared, with additions as the results of his long experience. One is sometimes astonished in reading this remarkable work at the prescience which the author displays in regard to certain processes in the treatment of teeth. And one is also astonished that his immediate successors profited so little from it, and that it was necessary to wait until almost the present time before connecting the thread of these discoveries, which have as a basis the destruction of the pulp and antisepsis of root-canals.

In short, one finds in Fauchard's writings information regarding operations on the destruction of the vital organ of the teeth by the hot iron and the extirpation of pulp débris with a fine stiletto. He was the first to understand the danger of leaving this débris under a filling; he was also the first to make use of antiseptics before the word was known or employed, by advising dressings of essence of cinnamon, which is now regarded as a first-class antiseptic.* He thus anticipated the use of modern antiseptic methods—which a more attentive and intelligent reading of his work might have caused to be employed a century sooner.

In addition to these discoveries, we owe to him numerous clinical observations and the description of ingenious surgical apparatus and systems of making artificial teeth.

Pierre Fauchard died at his residence in the rue des Grands Cordeliers on the 25th of March 1759, after a long and

fruitful life. He had all the qualifications for a school executive—common sense, clearness of style, boldness, and ingenuity. Unfortunately for us, as I said before, he had no pupils who could have treasured his scientific learning and practical experience, and it was not until much later that the broken chain was reunited; it was not even until the present day, after all the modern discoveries had been made, that the importance of Pierre Fauchard's work can be judged at its right value. Its importance is such that it may be compared to that of Ambroise Paré's studies in general surgery.

The knowledge of physics and morals of our great predecessors should be a subject of perpetual study for us. It will easily be understood after having read the foregoing that one of the joys of my life was to discover an authentic portrait of Pierre Fauchard.

I will here describe how I became the possessor of this precious historical document on the art of dentistry in France: This portrait previously formed part of Dr. Cusco's collection, which contained a great number of portraits of surgeons and doctors of the seventeenth and eighteenth centuries. I knew Dr. Cusco and had had the opportunity of viewing his collection which contained, besides portraits, instruments, and apparatus of ancient surgery and a remarkable library. I must say that I had not particularly noticed the portrait in question, which makes me suppose that Dr. Cusco himself did not realize to what extent this work of art would interest our profession, otherwise I think he would have pointed it out to me.

Upon Dr. Cusco's death there was a sale at the Hotel Druot, in which I was interested, knowing the rarities contained in his collection, and it was thus that in seeking to know the names of the portraits I discovered at the back of one of them, written on the canvas,

Pierre Fauchard
1726

—while higher up on the wooden frame was a name probably that of the painter Netscher.

* See Fauchard, 2d edition, vol. i, chap. x.

In several encyclopedias Fauchard is simply designated as a surgeon who was born in Brittany at the end of the seventeenth century and died in Paris in 1759; it is not astonishing, therefore, that he should merely have figured as such in this collection of surgeons and doctors of that epoch.

This portrait painted in 1726 represents P. Fauchard younger than that reproduced in the engraving of the second edition of his book published in Paris in 1746. In these two portraits he is represented in a costume almost identical, and in the same attitude; the portrait in the book was engraved by J. B. Scotin after J. LeBel. The original of this last portrait unfortunately is not known, but from the engraving one can easily compare it with the painting, and in spite of the years intervening between the dates at which they were made we discover a resemblance of the principal features: a long, thin face, high forehead, long straight nose, large eyes, expressive and intelligent, with the arched eyebrows well accentuated.

Is not that the picture of an intelligent and energetic man, corresponding with what we know of the intellectual and moral qualities of our illustrious colleague?

Discussion.

Dr. BROPHY. The Secretary-general has requested me to announce that this oil painting of our distinguished ancestor will be placed on exhibition in the Section on Education, Nomenclature, History, and Literature, which occupies the room at the extreme west end of the second floor of this building, at 2.30 this afternoon.

The PRESIDENT. This paper is now open for general discussion, and I desire to inform the members of the rules of the congress regarding discussions and debate. The person opening a discussion is allowed ten minutes, those taking part in the general discussion will be allowed five minutes, and five minutes will be allowed the author of a paper to close the discussion. I desire to state also that the time limit will be strictly enforced.

Dr. A. H. THOMPSON, Topeka, Kans. I have always been impressed with the study of the early workers of the profession, who brought dentistry out from chaos and gave it something of the standing and form which has led up to modern dentistry as we have it today. There is always an inspiration in the work of these early pioneers who were men of genius. When we study their lives we feel an uplifting influence which carries us upward and forward and makes us proud of our profession. These early men deserve great credit for what they did in their day. They brought dentistry out of chaos and laid the firm foundation of our profession; they did work of which they probably did not themselves fully understand the importance and realize the meaning, but we all know now what they did, and we are proud of them. The many historical names that have come down to us, show us what men can do who have the genius but had little in their environments to aid them. We are accustomed to saying that genius and environment is what makes men great. But this cannot be said of these men, because they had the genius and made their own environments, and laid the foundations upon which modern dentistry is built. I have always thought that men of those days ought to be an inspiration to the young men in our profession, as it shows what can be accomplished by earnest, devoted work. Even in our day there is work to be done by men of genius, but these have something to guide them—they have the environments and the foundations, but the men who laid these foundations are the men we honor today. These early historical days are very interesting, and the lives of the men of those days are profitable and valuable for us to study. In all these instances we are made to consider what men can do who earnestly give themselves to such a life, and we feel very grateful to Dr. Viau for having unearthed this portrait. (Applause.)

Dr. WM. H. TRUEMAN, Philadelphia, Pa. As members of the dental profession we cannot too greatly appreciate and honor the illustrious Fauchard, the first in

the world's history to write a fairly complete text-book on dental science. We have an insight to his character when he tells us in the preface to his work how deeply he regretted that none of the many competent practitioners of the art had published for the benefit of those who should come after them their experiences and observations, and that thus the knowledge they had acquired was lost to the world. In an effort to remedy this, after about twenty years' experience in the practice of dental surgery, he began his great work, "The Surgeon Dentist." This he completed about 1723, but delayed its publication for revision and correction until 1728. Although many treatises upon the teeth and their diseases had been published, either as separate volumes or as part of a medical work, this was the first to fully cover the whole field, and the first to minutely describe the various operations of surgical and prosthetic dentistry. It was, indeed, the first work written by a dentist for the information of dental students.

We honor Fauchard, not for his great skill, skilful as he undoubtedly was, and well versed in all that is embraced by the term "dental surgery." In this he may have been equalled, perhaps excelled, by some of his compeers whose names have long been forgotten. We honor him for the noble and unselfish spirit which prompted him to this task, and for the earnestness displayed in making known to his compeers and freely placing at their disposal all that he had learned, and all that he could persuade others to impart that might be helpful to them in their daily practice. His work inaugurated a new era. Fellow practitioners, inspired by his example, ceased to be competitors and became compeers, each anxious to help the other to increase their own usefulness and the usefulness of their calling. In the eight hundred and fifty fully written pages, and forty full-page illustrations of the "Surgeon Dentist," Fauchard gave to his profession a text-book that for completeness, accuracy of description, and frankness in describing operations and appliances, long remained without a peer. "If I have

failed to make the matter plain and easily understood," he writes, "it has not been from a desire to withhold information, but rather an unintentional failure to use the proper words." It was this fraternal spirit, an entire absence of all selfish motives, and an earnest desire to better and make the profession of his choice more useful to the community that made Pierre Fauchard a great man.

Like many other progressive men, however, he had long to wait before his work and his motives were fully appreciated. A motto added by the artist to Fauchard's portrait forming the frontispiece to the German edition of his work published in 1733, a portrait undoubtedly engraved from the original painting referred to by Dr. Viau, evidently refers to this. It reads—

Whilst Fauchard with wise hand and pen
For health and beauty of the teeth contends,
Envy's mad tooth is gnashed in vain;
His noble nature treats it with disdain.

The work so well begun by Fauchard was taken up by Mouton, Lecluse, Bourdet, Jourdain, and other of his countrymen, so that before the science had been transplanted to our shores, the whole field of dental science as we know it today was fully compassed by talented French writers. None, however, attempted to compete with Fauchard; they were content to write upon some one subject in which they were especially interested. It is much to be regretted that the dental pioneers of our own country were not sufficiently versed in the French language to have availed themselves of this rich fund of practical information. Being an English-speaking people, it remained to us a sealed book, until by the lapse of time it ceased to have other than historic value.

I am very glad, Mr. President, that this original portrait of Pierre Fauchard has been discovered, and that a faithful copy has been sent to this country by Dr. Viau. No more fitting time or place could have been selected for presenting the portrait to the profession than at this, the largest international dental congress ever assembled. Pierre Fauchard

inaugurated the spirit of professional fraternity which, growing with the passing years, made this grand meeting possible. All honor to Fauchard, and to his noble and generous countrymen! (Applause.)

Dr. CHAS. GODON, Paris. *Mr. President and members of the Fourth International Dental Congress:* I am greatly pleased that my *confrère* of Paris found this new picture of our great ancestor Pierre Fauchard, whom we call in Paris the father of French dentistry. I think that dentistry as a scientific profession began with the first book, the first journal, the first society, and the first school, as I stated in my work on "l'Evolution de l'Art Dentaire," and I am proud that we have the honor to have had the first book on dentistry by a dental surgeon, Pierre Fauchard, who wrote it in 1728, the first edition being called "Le Chirurgien Dentiste." We are interested in knowing that the first school was established in Baltimore in 1839, and that the first journal and society were likewise organized in America in 1839, and so I think it very interesting for us to know many things about that eminent man who took the first steps in scientific dentistry. I am very proud to have been delegated with my friend Dr. Sauvez to bring these pictures to you from our *confrère* Dr. Viau—one to be presented to Dr. Kirk, dean of the Department of Dentistry of the University of Pennsylvania, and the other to Dr. Brophy, dean of the Chicago College of Dental Surgery. (Applause.)

Dr. J. E. GREVERS, Amsterdam, Holland. *Ladies and gentlemen, members of the Fourth International Dental Congress:* It was with great pleasure that I listened to the communication of Dr. Viau, and certainly I was pleased to see the original portrait of Pierre Fauchard. Those who delight in reading old books will appreciate the communication of Dr. Viau, and I thank you for the opportunity given me at this time to tell you that I read the first edition of Fauchard's work with the greatest pleasure, and that I received from it much information. You have no idea what a source of information is found in this book, and it is

particularly interesting to observe in the introduction to his book a delineation of what the dentist should be personally and in his habits. This book has been for these long years a source of information to all who have read it. You will find that his successors Bourdet, Delabarre, and others have largely used this book to give information to their readers. Of course, the pictures of his instruments and demonstrations are crude, but I find in the book very fine pictures of anomalies of the teeth, and it is marvelous with what perspicacity Fauchard has taken into consideration everything demanded in dentistry.

As Dr. Godon stated, Fauchard's first book was entitled "Le Chirurgien Dentiste." In this work he speaks of filling teeth, and gives pictures of instruments. Fauchard must have borrowed from older writers, for you know that Arculanus was the first to mention the filling of teeth with gold. Fauchard also mentioned the filling of teeth with gold. The extraction of teeth was practiced at that time perhaps very much the same as it is now. We find in Fauchard pictures of forceps that are the precursors of the forceps invented by Tomes later on. His chapter on artificial teeth is very interesting, and you will find in this book what is now called crown and bridge work and pivot teeth. The diseases of the teeth were closely watched by him at that time, and his descriptions of the many observations on dental diseases are worth reading. I feel with Dr. Trueman that it is a great pity, when many old writings were republished by the American Society of Dental Surgeons, that we should find the book of Delabarre translated while the work of Fauchard has been neglected. It is a great pity, and I dare say that if the book of Fauchard were translated into English you would all highly appreciate it. (Applause.)

Dr. B. L. THORPE, St. Louis, Mo. I am much pleased that this contribution to dental literature has been brought before this congress. There is no question that Fauchard has a very prominent and unique place in the history of the dental

profession. He has stood out pre-eminent as the man who was the progenitor of modern dental surgery, and the influence of his work has been handed down to us through the pioneers that I referred to yesterday, who came to America at the time of the Revolution, and these men—Lemaire and Gardette—following the teaching of Fauchard, were the men who introduced dental surgery into America. Fauchard was a medical man, as the paper states, and he was the one who gathered the scattering fragments, as it were, of dental knowledge and inaugurated the dento-surgical section of the medical profession. His name is the most prominent of any European as a pioneer. He has occupied in Europe the same position that Hayden and Harris have since occupied in America, and I am pleased to know that Dr. Viau, has gathered this historical data and the portrait and presented it here. It is something which to my knowledge has never before been presented before the dental profession, an historical and biographical review of the life and works of Pierre Fauchard. (Applause.)

Dr. T. W. BROPHY, Chicago. Mr. President, I have nothing to say further than, life my friends, to express my appreciation of the services of Dr. Viau in taking the great pains he has in gathering up this information bearing upon the life of this Frenchman and presenting it to the Fourth International Dental Congress. We all appreciate very much this work of his, and we are glad to have placed in the literature of this great congress matter of so much importance to us. It makes us feel proud of our profession, and it stimulates us to go forward and do the best we can to carry it on to a higher plane. (Applause.)

Dr. E. C. KIRK, Philadelphia. Mr. President, I may perhaps exaggerate it in my own mind, being especially interested in this question of dental history, but it does seem to me that the finding of this portrait and bringing it before this audience with a more accurate knowledge of the life-work and history of Pierre Fauchard is an act to be signaled by something more than the mere discussion

of the paper. And I therefore move that the congress pass a vote of thanks for the pains that Dr. Viau has taken in gathering this data, and for the opportunity he has given us to review in our minds the history of this illustrious man.

The motion was carried, and the congress extended a rising vote of thanks to Dr. Viau for his contribution.

The PRESIDENT. The next order of business is the reading of a paper by Dr. John S. Marshall, and I take great pleasure in announcing that Dr. Chas. Godon, honorary president of this congress for France, will occupy the chair during the reading of Dr. Marshall's paper.

Dr. JOHN S. MARSHALL, of the United States Army dental corps, president of the examining and supervising board of dental surgeons for the United States army, then read his paper, as follows:

THE UNITED STATES ARMY DENTAL CORPS.

Mr. President, members of the Fourth International Dental Congress, ladies and gentlemen: It is my pleasing duty to invite your attention today to a subject which was suggested to me by the secretary of your Committee of Organization as a fitting theme for this occasion, namely, the United States Army Dental Corps—a subject which he assured me was of great interest to the American members of the congress and also to the members and our guests from foreign countries, but more particularly to those who are interested in the establishment of similar organizations in the armies of their own countries. I shall therefore endeavor to place before you such facts in relation thereto as will give you an intelligent idea of this branch of the medical service of the United States army. Before placing these details before you, however, I desire to invite your attention for a few moments to certain well-established scientific facts in relation to the prevalence of dental diseases among civilized nations, and also certain other facts gained from observation and experience in military dental practice

relative to the great need of the services of dental surgeons in the United States army. I also believe, judging from reports coming from British and German military authorities, there is equal need of such services in those armies, and I have no doubt, if the facts were known, similar need would be found to exist in all the armies of the civilized world.

It is a fact generally admitted by dental pathologists and practitioners that dental caries and its sequelæ are the most common diseases of the human race, and that these diseases are constantly increasing in prevalence, particularly among civilized nations; and as further proof of this statement the following statistics are presented:

The prevalence of dental caries among American grammar-school children was computed by Ottoby from an examination of 14,644 teeth. Caries was present in 27.33 per cent. in males and 32.67 per cent. in females. In an examination of the naval apprentices of the British training-ship "Exmouth" made at about the same period, the average age of the boys being about fourteen years, it was found that 76 per cent. of them had carious teeth. In a more recent examination of the teeth of the school children of Northern Germany, conducted by Dr. Greve of Lubeck, the ages of the children being between twelve and fifteen years, it was found that 94.5 per cent. of them had dental caries in its various stages of development.

The statistics of the United States army dental corps show that dental diseases are as prevalent among the officers and enlisted men of our army as among individuals in civil life of the same social class, while among the troops who have served in tropical and semi-tropical climates these diseases are much more prevalent.

The Surgeon-general's report for 1903 shows that the percentage of dental diseases for troops serving only in the United States was 42.85. For those serving in the Philippine Islands the percentage was 61.12, or 18.27 per cent. higher than for the troops who served only in the United States: while for the

troops who served in Cuba and Porto Rico the percentage was 64.02, or 21.17 per cent. higher than for the troops serving in the United States. The increased percentage of dental diseases among the troops who served in Cuba and Porto Rico over those serving in the Philippine Islands is due to the fact that these diseases are generally more prevalent among the native troops of Porto Rico than among the white troops.

The records of my office at the General Hospital, Presidio of San Francisco, show that from October 1, 1901, to July 1, 1904, 4533 cases have been examined and treated for dental and oral diseases, and out of this number only one person has been found who was absolutely free from dental caries; this was a young lieutenant just graduated from West Point military academy.

In an examination conducted by two of my assistants of two regiments of infantry recently returned from the Philippines, it was found that in one regiment 87.62 per cent. and in the other 93.46 per cent. of the men examined were in need of immediate dental treatment.

The statistics for the first-mentioned regiment are as follows:

Total No. enlisted men.....	738
No. absent for various reasons.....	27
No. enlisted men examined.....	711
No. not needing dental treatment.....	77
No. needing dental treatment.....	623
Per cent. of regiment needing treatment.....	87.62

Diseases.

No. of teeth with dental caries.....	2280
So badly diseased as to require extraction	321
Can be saved by appropriate treatment..	1959
Men needing immediate treatment for pulpitis and dento-alveolar abscess.....	277
Cases of salivary deposits	182
“ “ gingivitis	42
“ “ pyorrhea alveolaris	4
“ needing artificial dentures.....	14

The statistics for the other regiment are as follows:

Total No. enlisted men in the regiment...	780
No. absent for various reasons	15
No. enlisted men examined	765
No. not needing dental treatment.....	21
No. needing dental treatment.....	744
Per cent. of regiment needing treatment.....	93.46

Diseases.

No. of teeth with dental caries.....	3565
So badly diseased as to require extraction	197
Can be saved by appropriate treatment..	3221
Men needing immediate treatment for pulpitis and dento-alveolar abscess.....	97
Cases of salivary deposits	196
“ “ gingivitis	60
“ “ pyorrhea alveolaris	10
“ needing artificial dentures.....	18

The Surgeon-general's report above referred to shows that during the calendar year 1902 there were 16,161 officers and enlisted men treated for dental and oral diseases, this number being exactly 20 per cent. of the mean strength of the army for that year, and that 49,483 operations were performed. These operations were largely of an emergency nature and necessary to fit the men to perform their military duties. The average number of operations performed for each person was 3.06.

During the Boer war the British military authorities found it necessary to take cognizance of the fact that their troops in the Transvaal were suffering greatly for the need of the services of skilled dental surgeons. This need was recognized by the government, and one dental surgeon with twelve assistants—undergraduate students from the London Dental Hospital—were sent out to meet this need, inadequately of course, if I may be permitted to judge from my own experience in the United States army.

More recently the British government has regularly appointed eight dental surgeons for duty with the troops of the United Kingdom, but medical officers who are familiar with the needs of the service in this direction have called attention to the fact that this number is entirely inadequate, and that if the desired results are to be obtained a much larger number must be provided.

The German government, through Dr. Richter, a staff surgeon of the German army, has been investigating the question of the need of dental surgeons in the German military service, and he reports that upon the examination of 1000 men of a Saxon regiment he found only 61 who had thoroughly sound teeth,

or in other words 93.9 per cent. of the men were in need of dental treatment. Of this number there was an average per capita of nearly two teeth missing and more than four decayed. Of the decayed teeth less than one-half could have been saved by proper treatment, the remainder requiring extraction. In another regiment Dr. Richter found that the number of teeth extracted yearly was about 2300, while 2100 fillings had been placed in decayed teeth and fifty sets of artificial teeth had been supplied. It will be noticed that these statistics are so near to those of the United States army as to be practically the same, thus proving conclusively that dental and oral diseases are about equally prevalent in all civilized nations.

As a result of the investigations of Dr. Richter the general staff of the German army has authorized the issue of instructions to the entire German army in relation to the hygiene of the mouth. Lectures upon the various branches of the subject have been arranged for, attendance upon which is compulsory, and non-commissioned officers are required to see that all prescribed regulations relating to the care of the teeth are rigorously enforced. The medical officers of the German army are hoping that the inquiries of Dr. Richter will lead to the establishment of a corps of dental surgeons. Similar recommendations were made by myself to the Surgeon-general of the United States army more than two years ago.

When the facts are taken into consideration that the officers and enlisted men entering military life are in the flower of their young manhood and that the military medical examiners exclude all but the physically perfect, these statistics in relation to the condition of the teeth of the soldiers is somewhat alarming, and the question that very naturally arises in our minds is, What is to be the outcome of this rapid deterioration of the teeth? Good teeth, or at least serviceable teeth, are exceedingly necessary as a means of maintaining the general health of the individual soldier and consequently of the highest efficiency to an army, particularly when campaigning in

the tropics, where the conditions of climate are so enervating and debilitating to the general system, and the necessary changes in the habits of life to meet the new environments are not conducive to the highest physical development and vigor. Resistance to disease under these conditions is greatly lessened, and the individual is consequently predisposed to a certain class of diseases, among which are dental caries, pulpitis, pericementitis, dento-alveolar abscess, pyorrhea alveolaris, necrosis of the jaws, inflammatory and ulcerative conditions of the gums, the oral mucous membrane, the throat and tongue; while various general affections are superinduced as a result of the diseased condition of the teeth and oral cavity or the crippling of the function of mastication by the loss of the teeth, such as indigestion, dyspepsia, gastritis, enteritis, colitis, and numerous nervous affections. The remedy for this alarming condition of dental and oral diseases lies in teaching the soldier the value of oral hygiene, and in furnishing the army with an adequate number of dental surgeons to properly care for the dental diseases of the troops in garrison and in the field. The number of dental surgeons in the United States army and in the British army are entirely inadequate for the ever-present and increasing needs in this direction.

With this somewhat lengthy introduction to my theme I will proceed without further delay to place before you the

PLAN OF ORGANIZATION OF THE UNITED STATES ARMY DENTAL CORPS.

Personnel. The corps is composed at the present time of thirty dental surgeons, divided into a board of examining and supervising dental surgeons, three in number, who were nominated by the Surgeon-general and appointed by the Secretary of War for the purpose of examining candidates applying for appointment in the corps and to supervise the work and the operations of the corps. The officers of the board are a president, who is the senior, and a recorder, who is the junior member of the board. The

balance of the corps is made up of twenty-seven dental surgeons who have passed satisfactory professional examinations before this board, and have been appointed by the Secretary of War upon the recommendation of the Surgeon-general for service with the troops.

Official status. The official status of the dental surgeon is a somewhat anomalous one. He is not a commissioned officer nor an enlisted man, but a civil employee. He enters the service under a contract, with the *relative* rank of a first lieutenant, which requires him to perform all the duties of a commissioned officer except to serve on courts-martial or to make contracts for and in the behalf of the government. He is held to the same strict property accountability as a commissioned officer and subject to the same rules and regulations governing the service. But he has no military status, no opportunity for promotion, and is not entitled to commutation of quarters, increased pay for foreign service, longevity pay, or retirement for disability or age.

The contract dental surgeon differs from the contract surgeon in that he does not have an opportunity, as they do, by passing an examination, to enter the medical corps of the regular army. Recent decisions of the Judge Advocate-general have taken away the right of contract surgeons and dental surgeons to issue commands to men assigned to duty under them, consequently it will be necessary in the near future to abolish the contract system as applied to the medical department altogether, and provide a way by which contract dental surgeons may also enter the regular commissioned service.

Pay and allowances. The pay of a contract dental surgeon is \$150 per month, which is in lieu of all other allowances except quarters when available. If quarters are not available at his station he must provide them for himself. He has the right, however, to purchase supplies from the Quartermaster's and Subsistence departments at the government rate.

Tenure of office. The contracts made by the War Department through the

Surgeon-general or a chief surgeon of a military department are for a term of "not less than three years," and may continue indefinitely thereafter at the will of the contracting parties. Contracts, however, may be annulled at any time by the Surgeon-general or by a department commander for the good of the service, disability, or no further need for services.

Examination of candidates. The examinations consist of—(a) physical condition; (b) written and oral questions upon the studies of the dental college course; (c) practical demonstrations in operative dentistry; (d) practical demonstrations in prosthetic dentistry.

(a) The physical examination is conducted by an army surgeon detailed for this purpose and upon the same general lines as those in vogue for entrance into the other departments of the army. Perfect health and freedom from physical defect are necessary to pass this examination; but defective eyesight which can be corrected by appropriate glasses does not debar the candidate.

(b) Written and oral examinations are conducted upon the following named subjects, and the candidates must attain a general average of seventy-five per cent. upon each of them: Anatomy, physiology, histology, chemistry, physics, metallurgy, dental anatomy, and physiology, dental materia medica and therapeutics, dental pathology and bacteriology, orthodontia, oral surgery, operative dentistry, prosthetic dentistry.

(c) The practical examination in operative dentistry consists of the following: 1. Examination and recording the condition of the mouth and teeth. 2. Preparation of cavities—(a) by hand instruments; (b) by engine instruments. 3. Instrumentation and technique. 4. Preparation and manipulation of filling materials—gold, tin, amalgam, gutta-percha, oxyphosphate cement. 5. Insertion and finishing of fillings. 6. Treatment and filling of root-canals and preparation of root for pivot crown. 7. Manipulative technique in removal of calcareous deposits. 8. Application of rubber dam, metallic separators, matrices,

etc. 9. Diagnosis, prognosis, and treatment of oral diseases. 10. Care and sterilization of instruments and hands.

(d) The practical examination in prosthetic dentistry comprises—1. Impressions, casts, bite, and articulation (occlusion). 2. Construction of denture in vulcanite. 3. Construction of dies and counter-dies from impression to completion. 4. Construction of swaged plate, with metal and rubber attachment. 5. Construction of interdental splints. 6. Construction of Richmond crown.

Upon all clinical or practical demonstrations the candidate must attain a general average of eighty-five per cent. The reason for this higher requirement in the practical branches is made evident by the statement that practical men are needed in the service, not theorists. But it may also be stated that practical ability alone would be of little value in military dental practice. The dentist to be successful in this new field of practice must be thoroughly informed upon all those subjects and theories which form the foundation of modern dental surgery. He will need to be self-reliant and capable of conducting any case that may come under his special care, no matter how serious it may be, for he will many times be so located that he cannot obtain the advice of a consultant in his specialty; while, on the other hand, he may be, and that frequently, called in by the post surgeon as a consultant in cases which present oral or dental lesions; or which by reason of certain symptoms the surgeon is led to believe may be dependent upon some obscure dental or oral malady and upon which he desires an expert opinion to assist him in an intelligent treatment of the case, or recommending the discharge of the patient for physical disability incident to the oral or dental condition.

ARMY REGULATIONS GOVERNING THE PROFESSIONAL DUTIES OF THE DENTAL CORPS.

The following regulations, having received the approval of the Honorable the Secretary of War, become, with the gen-

eral regulations bearing upon officers of the army, the law governing contract dental surgeons:

Candidates for appointment as dental surgeons must be not less than twenty-four nor more than forty years of age. They must be graduates of standard medical or dental colleges, trained in the several branches of dentistry, of good moral and professional character, and prior to appointment will be required to pass a satisfactory professional examination before a board of dental surgeons convened for that purpose by the Secretary of War.

Contracts with dental surgeons will be made for three years, but may be annulled at any time by the commanding general of a military department, after official investigation, for conduct to the prejudice of good order and military discipline, or by the Surgeon-general when in his opinion a termination of the contract would be in the interests of the service.

Dental surgeons are attached to the medical department and will be assigned to duty in accordance with the recommendations of the Surgeon-general of the army or the chief surgeon of a military department.

A dental surgeon when assigned to a station will apply to the post commander for a suitable operating room. If no other room be available the surgeon of the post may assign him a room in the hospital.

Each dental surgeon will ordinarily be allowed one enlisted man as an assistant, who will be detailed from the sergeants or privates of the Hospital Corps, and whose duty it will be to assist the dentist in his operations, in caring for the instruments and other public property, in keeping the records, and in the performance of such other official work pertaining to the position as he may be directed by the proper authority to do. When a member of the Hospital Corps is detailed as a dentist's assistant he will receive commutation of rations at the rate of one dollar daily, and he will be provided with a suitable room as quarters by the Quartermaster's department, except while on duty at a post, when he will be attached

to the hospital corps or other organization for rations and quarters. Necessary dental instruments and supplies will be purchased by medical supply officers under instructions from the Surgeon-general and in accordance with a supply table approved by the Secretary of War.

Dental surgeons will be held strictly accountable for all instruments and supplies issued to them, and will be governed by army regulations and orders now in force, or hereafter to be issued, with reference to accountability for government property.

In accordance with the act of Congress authorizing their employment, dental surgeons will "serve the officers and enlisted men of the regular and volunteer army." The families of officers and civilian employees attached to the army are not entitled to their services. In this connection contract surgeons are to be regarded as commissioned officers.

Dental surgeons will operate between the hours of 9 A.M. and 4 P.M. only upon those officers and enlisted men who are entitled to their services. They may operate upon others not entitled to free services before and after those hours when their services are not required by those entitled to them, but material issued to them by the government will only be used in operations upon officers and enlisted men of the army.

Dental surgeons of the army will not perform any operation upon officers or enlisted men or prescribe medicines for them other than those necessary for the treatment of the teeth and gums. This prohibition does not apply to cases of emergency where no medical officer is within reach, and where a dental surgeon is able to render the necessary surgical assistance to meet the immediate emergency.

Emergency work, whether for officers or for enlisted men, should always have precedence. Plate work or restoration of teeth by any method will only be done for those who have lost teeth in the service and in the line of duty. For plate work or filling teeth only the cheaper materials will be supplied, but gold may be used, if the operating dentist sees fit to

use it, at the expense of the individual operated upon.

Enlisted men requiring the services of the dental surgeon will, at an hour prescribed by the commanding officer, be conducted to the designated place under a non-commissioned officer, who will take with him and hand to the dentist a list of those reporting for treatment. This list will be entered in a day-book ruled in columns for surname, given name, rank, company, regiment, etc., all headings to be the same as those borne on his monthly report.

All cases requiring treatment involving future appointment will be so noted, and the others will be marked according to the circumstances, as "treatment unnecessary," "further treatment unnecessary," "should be sent to the surgeon," etc. When future treatment is necessary the dentist will forward a card as follows:

....., 19..
THE ADJUTANT:
.....
Sir,—I have the honor to request that....
.....be directed to report to me from
.....M. to.....M. oninstant
for treatment.

Very respectfully,

.....
Dental Surgeon.

Dental surgeons will submit a monthly report (on prescribed blanks) of all official work done by them, giving all required data in every case in which professional services were rendered. This report will be an exact copy of the register kept for the period. One copy will be sent on the last day of the month to the Surgeon-general, through the chief surgeon of the department in which the dental surgeon is serving.

Dental surgeons will also prepare a tabular statement for each month on blanks termed "Numerical report of dental operations," showing the number of persons treated, the number of cases of each disease and injury, the operations performed and the restorations by the use of fillings of each kind and by the use of bridges, crowns, and appliances. On the back of this sheet will be shown, by races, the individual teeth affected by

caries. This report will be forwarded each month with the dental surgeon's report of operations.

The supply table. This table is too long to present in this place, but it may be stated that it includes a portable dental chair and a dental engine, packed in separate cases; burs, mandrels, stones, disks, etc.; excavators, chisels, scales, plastic-pluggers, gold-pluggers, rubber-dam clamps, clamp forceps, dam punch, extracting forceps, elevators, steam sterilizer, hand cuspidor, etc., in fact, all of the instruments and adjuncts that are really necessary to perform any operation upon the teeth, except for crowns, bridges, and artificial dentures. Each outfit contains medicines and supplies of filling material sufficient for three months' service. The smaller instruments and the supplies are packed in two strong cases, arranged with trays and receptacles to hold the instruments and supplies in place. The whole outfit when cased and crated weighs about 450 lbs. To protect the cases from rain and dampness they are inclosed in canvas covers. The general hospitals, and such other posts as may be designated by the Surgeon-general, are furnished with an additional outfit, consisting of a regular office operating chair, Allan bracket, cuspidor, instrument case, extra extracting forceps, and a full laboratory outfit for constructing vulcanite plates, swaged metal plates, interdental splints, crowns, and bridge-work.

Nosological table and system of keeping records. The ordinary system of keeping records in civil practice by means of charts could not be employed in military practice, for the reason that it would occupy too much space. As a substitute for this the following system has been devised and has received the approval of the Surgeon-general.

DISEASES AND INJURIES OF THE MOUTH.

Abrasions (mechanical).

Abscess of the jaws (associated with impacted teeth).

Calcification of the pulp.

Caries.

Cysts of the jaws (associated with devitalized teeth).

Dento-alveolar abscess.
 Erosion (chemical).
 Fractures of the teeth.
 Hemorrhage (following extraction).
 Hypertrophy of the pulp.
 Hypertrophy of the gums.
 Hypercementosis.
 Necrosis of the teeth.
 Pericementitis, acute.
 Pericementitis, chronic.
 Pulpitis, acute.
 Pulpitis, chronic.
 Pyorrhea alveolaris.
 Resorption of the alveolar process.
 Salivary deposits.

NOTE.—The duties of the dental surgeon will ordinarily be confined to the treatment of such cases as are directly associated with the teeth and gums; but occasions may arise when his services would be required as a specialist in the treatment of diseases and injuries of the mouth and jaws, such as cysts of the salivary ducts, empyema of the maxillary sinus, fractures of the jaws, gingivitis, necrosis of the jaws, facial neuralgia, stomatitis, and tumors of the gums, jaws, etc.

CLASSIFICATION OF THE TEETH.

1. Superior central incisors.
2. Superior lateral incisors.
3. Superior cuspids.
4. Superior first bicuspid.
5. Superior second bicuspid.
6. Superior first molars.
7. Superior second molars.
8. Superior third molars.
9. Inferior central incisors.
10. Inferior lateral incisors.
11. Inferior cuspids.
12. Inferior first bicuspid.
13. Inferior second bicuspid.
14. Inferior first molars.
15. Inferior second molars.
16. Inferior third molars.

In designating the teeth, and in recording all operations upon them, the dental surgeon will indicate the tooth by the following plan, using the letters R. and L. to designate the right and left sides, and the figures 1, 2, 3, etc., to designate the tooth. Examples: R. I. Right superior central incisor; L. 14, Left inferior first molar.

CLASSIFICATION OF CAVITIES.

Simple Cavities on Exposed Surfaces.

Incisors and cuspids.	Bicuspid and molars.
A. Labial.	D. Morsal.
B. Lingual.	E. Buccal.
C. Morsal.	F. Lingual.

Simple Approximate Cavities.

Incisors and cuspids.	Bicuspid and molars.
G. Mesial.	I. Mesial.
H. Distal.	J. Distal.

Compound Cavities.

Incisors and cuspids.	Bicuspid and molars.
K. Mesio-labial.	R. Mesio-morsal.
L. Disto-labial.	S. Disto-morsal.
M. Mesio-lingual.	T. Morso-buccal.
N. Disto-lingual.	U. Morso-lingual.
O. Mesio-morsal.	V. Mesio-disto-morsal.
P. Disto-morsal.	W. Bucco-linguo-morsal.
Q. Mesio-disto-morsal.	

In recording all operations of filling the teeth, the cavity will be described by the dental surgeon according to the preceding classification, using the letters A, B, C, etc., to designate its location.

Example: A, Simple cavity in labial surface of an incisor or cuspid tooth. I, Simple cavity in mesial surface of a bicuspid or a molar. V, Compound cavity in mesial, distal, and morsal surfaces of a bicuspid or a molar.

CLASSIFICATION OF FILLING MATERIALS.

Tin.	Oxyphosphate.
Amalgam.	Gutta-percha.

The kind of filling material employed will be indicated by using the first letter of the word designating that material.

Example: R. 5 V. A. Tooth, right superior second bicuspid; cavity, mesio-disto-morsal surfaces. Filling material, amalgam. If a combination filling is employed it will be designated by the first letters of the words designating the materials used. Example: L. 7 S. G.-O. Tooth, left superior second molar; cavity, disto-morsal surfaces; filling material, gutta-percha and oxyphosphate cement.

Exception: The only filling materials furnished for the use of the dental surgeons by the medical department are those enumerated above. Gold, however, may be provided by the dental surgeon and inserted for those officers and enlisted men who are willing to reimburse him for its cost. The minimum fee to be one dollar, and the maximum two dollars, for such filling.

In recording operations made with gold the full word should be written out.

Other operations upon the teeth will be designated by a combination of letters, as follows:

Abscess lanced . . . A-L.	Root-canal filled. . R-F.
Calculus removed. C-R.	Tooth extracted. . T-E.
Pulp devitalized. . P-D.	Tooth treated . . . T-T.
Pulp extirpated. . P-E.	

One hundred of these record sheets are bound in a book, and form the "Register of dental operations." Each month the dental surgeon is required to send to the Surgeon-general an exact transcript of the register of the operations performed during the month, upon blank sheets known as the "Monthly record of dental operations." These reports are placed on file for future reference. The register when filled is transmitted to the Surgeon-general and also placed on file.

These records form an important means of identification in case of death or desertion, while to the Pension Office they will prove of value in passing upon those applications for pension which are based upon the loss of teeth while in the service of the United States army.

They will also prove to be of immense value from the scientific standpoint, in efforts to settle the questions of the relative prevalence and spread of dental caries among men who have been selected for military service because of their perfect physical condition, as compared with men in civil life; of the relative increase in this disease resulting from physical and nervous strain of severe campaigns and of residence in tropical climates; of the causes and prevalence of pyorrhea alveolaris, gingivitis, stomatitis, and kindred oral affections.

It will be noticed by the regulations governing the army dental surgeons and the rules laid down by the Surgeon-general, that the only filling materials which are furnished by the government are tin and the plastics; but the dentist is not prohibited from using gold, if the officer or the enlisted man be willing to reimburse him for the material used. (This material he must carry with him at his own risk.) In fact, he is encouraged to use gold by being furnished with instruments and appliances with which to perform this class of operations. He is furthermore furnished with a private or a sergeant of the hospital corps, whom he is expected to train as an assistant. With such intelligent assistance there is no reason why as good gold fillings may not be inserted by the military dental surgeon as by the dentist in civil practice.

The character of the service which can be rendered in the field must of necessity be that of meeting emergencies. Relief from suffering is the first object of the treatment, and the introduction of temporary fillings to protect the teeth from further decay until a more favorable opportunity can be secured for inserting a permanent filling.

The dental surgeon will, however, as a rule, be located at posts and stations of a more or less permanent character, where he can conduct his practice with as much care and thoroughness as is possible with the civil dental surgeon.

Each dental outfit is provided with a quantity of modeling composition and impression-trays, so that fractures of the maxilla can be treated temporarily by interdental supports made from the modeling composition while the patient is being transferred to the general hospital, where facilities will be found for constructing any form of interdental splint or other mechanical apparatus that might be indicated.

The army dental surgeon is expected to confine his professional services to the treatment of the diseases of the teeth and their associated parts, but the regulations provide that in cases of emergency, when no surgeon is present, he may, if competent, render any assistance that the case may demand.

The dental surgeons located at general hospitals and large posts are furnished with as good and as complete an outfit for a general dental practice as is found in the offices of the best civil practitioners. At such stations the dental surgeons have frequent opportunities for the treatment of cases in orthodontia for the children of the officers of the station, or inserting bridges, crowns, and artificial dentures for the officers and enlisted men, and for their families; while the general hospitals furnish a certain number of cases of fractured maxilla that need to be treated by the construction and insertion of some one of the various forms of interdental splints.

From the foregoing it will be seen that the War Department, through the recommendations of the Surgeon-general, has

provided for the care and treatment of the dental and oral diseases of the army in as thorough and as scientific a manner as is possible under the exigencies of military life and movements. Experience, however, may make it necessary to institute certain changes and modifications in the present system of service, and when such action is proved to be essential to the welfare of the army and an increased efficiency of the corps there is no doubt that the proper authorities will immediately institute such changes and modifications.

Discussion.

Dr. C. S. STOCKTON, Newark, N. J. I take the ground that if a man is sick in his teeth, he is equally as sick as if afflicted in any other part of the body, and should therefore receive proper treatment. The time has come when these brave boys who go out to defend our homes and our honor should be prepared to do so, and they should have the same treatment and the same care and consideration, if not more, than that of any other class for whom we care, for no soldier can do his duty with the toothache. It is appalling almost, Mr. Chairman, to think that only twenty per cent. receive the attention they should receive. Every man in our army—officer or private—ought to receive the treatment that he needs, and it should be one hundred per cent. We are coming to the period, Mr. Chairman, when we shall demand and when he will receive this treatment. I admit perhaps that we have not been in a position to take this stand. It has been stated that we are only dentists. We mean that in the future, when you say we are only dentists, it shall mean everything that is requisite to treat the human body. We have taken the position here since the board of examiners met, that the young men coming into the profession shall have an education equivalent to that required to enter the freshman class of any university in this country. And the faculties of the dental institutions of this country will be compelled to make that requirement, and the

examining boards of this country will stand behind these faculties, and if they do not come up to that standard their young men will not receive a license to practice. And that, Mr. Chairman, will place dentistry in the position that it should occupy—on an equal basis with medicine. The dental surgeon in the army shall have the same treatment and the same consideration, the same title and the same honor, that is accorded to the medical man. It is only right, and we shall gain it. I claim also that the time will soon come when the brave boys in our navy will have the same treatment as those in the army, and when the time comes to ask for this I hope that you gentlemen scattered throughout this broad land of ours will make your influence felt in Washington, so that when the bill comes up for the consideration of the grade to be given to dentists in the army and for the organization of a dental service in the navy, your representatives in Congress will be fully informed. (Applause.)

Dr. TRUMAN W. BROPHY, Chicago. Mr. President, this is a world's congress of dentists, and we are dealing with subjects that pertain to the dental surgeons of the armies and navies of the world, and I take great pleasure in saying that while studying this question in other countries, I have found that it is essential that every physician and surgeon who enters the English army at the present time must have taken a course in the diseases of the teeth. Every surgeon that enters the Spanish army must have a course in dental pathology that he may recognize and may be qualified to relieve distress in the case of each soldier and sailor in the service of his country. I hope we will look upon this question from the broad point of view of the world, so that this discussion may bear upon soldiers and sailors wherever they are found representing their respective countries. Resolutions have been offered in the past requesting, and expressing the opinion, that dental surgeons should be appointed in all countries, and I sincerely hope that this body will take up the matter and pass resolutions as an expression of

opinion, that dental surgeons should be appointed wherever the soldier and sailor may be found. (Applause.)

Dr. WMS. DONNALLY, Washington, D. C. Mr. President, I have listened with attention and interest to the reading of the paper, and have heard with surprise the discussion. It is not my purpose to discuss the paper, which is so full and complete and covers the ground so thoroughly that no additional word is necessary, yet it does seem to me, Mr. President, that it may be further discussed. Our distinguished friend from New Jersey has prepared you to expect a bill to be presented to Congress. He has proposed that you give your earnest support to the bill, but I would like to say that the National Dental Association has had for six years a committee in charge of this subject, and it was through the efforts of this committee that the contract corps of army dental surgeons was established, and through the efforts of this committee that the bills which have been for several years pending in Congress have been considered by the War Department and by the Navy Department, and by those committees of Congress which control the legislation for the army and navy of the United States. These bills provide commissioned rank for both army and navy dental surgeons and have been published in the dental journals—a fact which Dr. Stockton seems to have overlooked. They have received the most careful consideration and hearty support of many members of Congress. The naval and military committees of the two houses of Congress have for three years recognized the justness of the profession's claim for the status which is implied by commissioned rank. The military committee of the house, by a vote of eight to five, declared for commissioned rank. Secretary Moody on the 2d day of March, in accordance with a letter written on the 23d of February, 1904, to the authorities of Harvard, recommended to Congress the commissioned rank for dental officers of the navy. There is no authorized dental service in the navy in the proper sense, yet there are a very few dentists now serving

in the navy as yeomen or hospital stewards, and there is one civilian dentist employed by law at the naval academy. The army had some dental service even before the dental corps was organized, but they now have an efficient service, though inadequate in numbers and lacking rank.

As members of the committee of the National Dental Association, Dr. Finley and I are authorized to say to this Fourth International Dental Congress that an agreement has been reached by which the War and Navy departments concede the committee's contention for commissioned rank for military and naval dental surgeons, and, if the arrangement is not defeated by antagonistic influences, it is confidently expected that this committee will, in co-operation with those departments, secure reasonably satisfactory legislation by Congress at its next session.

I may say further that this committee has had the support of the profession and the co-operation of a large proportion of our men of influence and of the college authorities. The most effective aid in overcoming the navy's opposition was that alluded to as coming from Harvard University, and there seems now, Mr. President, nothing needed in the line suggested by Dr. Stockton. Indeed, sir, the battle has been persistently waged for years, and now that an agreement has been reached on the essential claim of the profession—*commissioned rank*—there can be no doubt that the military and naval committees of Congress, always favorable to our contention, will accord us at least all that the War and Navy departments concede. (Applause.)

Dr. LOUIS OTTOFY, Manila, P. I. Mr. President, I listened with a great deal of interest to the very valuable contribution of Dr. Marshall. I have had perhaps as much experience in this line as any man here. I have practiced for perhaps three thousand soldiers, members of the marine corps, and five hundred officers, from major down to second lieutenant. It has been my privilege to personally know the officers and the men, and while

I agree with much that the paper contains, I believe that we are discussing the whole question on a wrong basis. I may say here for the information of those who do not know what an army officer is, that you may live in the same neighborhood and become fairly well acquainted with him, yet he will not mingle socially with you; and it is absolutely necessary that it should be so for the greatest good. The purpose of the army officer is to fight in war and to prepare for fight in peace. These are the only two things in the head of the best officer there is. He studies engineering, science, tactics, and everything with no other purpose than these two things. The main object of the officer is to cut off from his train everything that is superfluous. And they would cut off the commissary train, but the men have to eat—but that they carry in as concentrated a form as possible. In the army they don't want the medical corps, but they have to have it. They fight continually to cut off everything that is unnecessary, and gentlemen, there is as much need for a chiropodist in the army as there is for a dentist. Now, the corps has done good work, and the gentlemen I have met are nearly all of them of high character, and represent properly as they should the profession, but I tell you, gentlemen, it is very important for them to make a big record! I have seen many of these men that go around as dentists put in ten small fillings in molars and call it ten operations. He does not put in gold fillings because the men have not the money to pay him, and those who have he works for after hours. Their salaries are small and the men have to have money, so they work outside for it.

Dr. O. M. SORBER, San Antonio, Texas. Dr. Ottofy makes some very serious charges with regard to the work done in the army. I don't know very much about other dental surgeons, or how they do their work, but he did not make any exceptions, and I believe I am an exception to the charges made, however much it may be true of others. I don't believe it is true of all others. I have seen some work done by army dental surgeons that

I would be glad to submit to the gentleman who has just spoken as samples of the work done. Each dental surgeon in the army has to keep a schedule and register of all the dental operations performed, and the doctor can see for himself by referring to the schedule all the operations performed by the dental surgeon. I think if he will examine these schedules he will find an unusually large number of large operations, compound fillings, root-canal fillings, etc. Unfortunately not very much crown and bridge work is done. The men have not time to do it, as each one has about four times as much work as he is physically able to do. I might say that while I was situated at Little Rock, in two days less than two months I did 789 operations, and in that number there were over a dozen gold fillings, at least three-fourths were amalgam fillings, and an unusually large proportion of large cavities. I think if any man does in two months that number of fillings he has done about all that can be expected.

Dr. A. W. HARLAN, New York, N. Y. The instructive and interesting paper read by Dr. Marshall, the head of the United States army dental corps, appeals to us in that it refers to the individual work done by the men in the corps that is not done by a single surgeon outside of the army. In this way it is an appeal for the permanent establishment of the corps with rank and pay sufficient so that when the man has done the work he will be entitled to increased compensation and be able to retire as does any other army officer. It may be true, as Dr. Ottofy says, that many men only strive to make a big record, but it is also true that when men go to these tropical climates they cannot physically perform the work done north of Mason and Dixon's line and even farther south than that. Another thing that appealed to me is the fact that this corps is irregularly organized, so that the services of the men can be dispensed with at any moment, even by a department commander; they have no permanent standing, and that is the particular thing to be noted from this most excellent and interesting paper.

Dr. M. F. FINLEY, Washington, D. C. *Mr. Chairman and gentlemen:* I wish to state that in my mind this is a very valuable contribution in support of the work that has been done by the National Dental Association. It bears out the contention first made by that association's committee to Congress in behalf of the establishment of a corps for the care of the teeth of the soldiers of the United States army. The data presented is gratifyingly supplemental and confirmatory of that which that committee offered Congress as evidence of the army's need for such a corps, and I am glad to have it presented here, and in the Surgeon-general's official report, because it so well supports the claims made by the profession's representatives.

I wish to say in answer to one statement made by Dr. Stockton about the comparative indifference of the government to the soldiers, that I have seen a copy of the regulations as drawn up by the medical corps of the army for the information and guidance of those concerned, in the division of the Philippines, and these regulations give the authority to court-martial the soldier who refuses to submit to an operation deemed necessary by the dental surgeon, in order to preserve health and fitness for military duty.

The contention of the National Dental Association through its committee has been for commissioned rank from the start, but the opposition of the War and Navy departments has stood in our way. Happily this obstacle has been cleared away in both departments during the past winter, and with this concession to our claim for commissioned rank there seems to be every reason to expect, as stated by Dr. Donnally, satisfactory legislation by Congress at its next session.

Dr. J. Y. CRAWFORD, Nashville, Tenn. Mr. President, being one of the duly accredited representatives of our government, I feel it my duty to state that this contribution is a very valuable one, though much of the paper I should have left out as unnecessary.

One suggestion made in the paper struck me very forcibly, and that was

that the United States Government has stipulated that when a man is writing a prescription for the treatment of dental caries, certain materials should not be supplied. Mr. President, the best should be supplied by the nations of the world for the treatment of the organs of mastication of their soldiers. No compromise should be made as to the quality of the therapeutic agent to be used, and I have the temerity to state that I think the nations of the earth should not compromise when it comes to making provision for the eradication of dental disease. If one agent be more efficacious and efficient, that one should be employed. The nation should not handicap a man when he undertakes to write a prescription for any kind of disease. Now I make this declaration in support of the teaching of the paper, to encourage the idea of meeting, in a general way and in every way, the adaptation of the dental surgeon to the wants and needs of the armies and navies of the world. (Applause.)

Dr. C. L. HUNGERFORD, Kansas City, Mo. I did not have the pleasure of listening to the paper, but I heard enough of the discussion to know its trend and that it is relative to giving the soldiers of our army and navy the best work commensurate with our opportunities.

The therapeutic agents to be employed or the materials to be used on the American soldier must be confined to those which the dentist can use under the adverse conditions of army life. No dentist with the number of soldiers he must necessarily have under his care could use what is ordinarily supposed to be the best filling material. He must use those things which will give the soldier the greatest comfort for the few years that he is in the army.

Dr. Ottofy was correct when he stated that the chiroprapist gave the soldier the greatest amount of comfort. It does not please you, I know, but it is true, and it is the truth that generally hurts. We cannot put operations of gold or porcelain in the mouths of the men who are to remain in the army for only a few years, nor can we put bridges in the mouths of these men as they should be put, there-

fore common sense teaches that we must seek and employ those materials that will give the greatest amount of good to the greatest number of soldiers. I think the government is right in excluding gold fillings, crowns, and bridges from the operations performed by the army dentist. The object of the government is to render to soldiers the best service in getting their teeth comfortable so that they can go into battle. It should not be expected to give a permanent operation to a man who is not in need of immediate attention, to the exclusion of others with the toothache.

Dr. CHAS. GODON, Paris. Mr. President, I would like to say a few things on this subject. This is not a national question, but an international one, and I must congratulate Dr. Marshall and the Committee of Organization for bringing it before the congress in general session, and I must congratulate your American government for this organization in the army, because in our country we cannot yet obtain such conditions. We have only begun to organize these institutions in France, and they are not complete to the extent that they are here. In the army dental service, as in other public dental services, the preference should be given to complete instead of emergency dentistry. I congratulate your government because I learn that in your army and navy your dental surgeons can insert fillings and do all other dental work when needed.

I have presented to the resolutions committee a resolution recommending for the poor complete dentistry instead of emergency dentistry, and I think this principle likewise applicable to the armies and navies of the world.

Dr. OTTO HOLLINGER, Chicago. It was my good fortune to serve the United States navy in the Spanish-American war as an ordinary sailor, and I agree with Dr. Marshall in the contention for dentists in the navy and in the army. It is true, as Dr. Ottofy stated, that the ordinary private both in the army and navy is not perhaps the patient that the general practitioner of dentistry who has practiced for twenty-five or thirty years

would care to spend his time upon. But, gentlemen, these same boys fighting behind the guns are taking your place and making it possible for you to practice in your own country. I have been among those boys, and I can very readily sympathize with them. When we were on board the flagship Lancaster at Key West, preparatory to going to Cuba, one of these boys, a marine, came to me with an aching molar. Unfortunately I had gone away so suddenly that I did not have any medicine or instruments with me, and I sent him to a surgeon, who found a third molar aching very badly. The surgeon thought that by extracting the third molar he would relieve the toothache, but he broke the tooth off, and thinking that the tooth was locked with the second molar, he extracted the second molar also, but the toothache was not stopped and he then extracted the first molar which was also decayed. There were three teeth lost, and the poor fellow was sent out to service, but he came back in about two weeks in a very bad condition and was sent to the hospital, placed under a general anesthetic, and the roots were taken out.

In the time of service one does not perhaps need crown and bridge work, but these men should have attention given to aching teeth, and then when they come into port they should receive the best that the science can give, because these men are giving their best to the government; the crown and bridge should be then put on with the best of gold and the best of care. Should the navy dentist become so proficient as to be able to command a better *clientèle*, he should then give way to the younger men. An experience of that kind is valuable to any man. Dr. Marshall's suggestions and statements will perhaps in the course of time be greatly modified, but as for belittling these men who are giving their lives for us for from thirteen to nineteen dollars per month, I do not think that the Fourth International Dental Congress should go on record as countenancing anything of the kind. (Applause.)

Dr. C. M. WORK, Ottumwa, Ia. I am very glad to have had the opportunity of

hearing Dr. Marshall's paper, and I want to congratulate him on the able manner in which he handled his subject. I have been very much interested in the army dental service for a number of years. I am one of the men whom Dr. Donnelly spoke of as having practiced before there was any organized dental corps. I can see lots of flaws in the way the corps is organized which of course to my mind seem faulty, but whether I could do better would remain to be seen. I know in the present condition, when a soldier meets a dental surgeon he would not respect him the same as if he were a commissioned rank officer. I was a private myself, and practiced for the soldiers and the surrounding people. I hope to see the dental corps of the United States army supplied with men of ability and in sufficient number to carry out any kind of service the private soldier or the officer in the regular army may need, not restricting them to certain materials for their use, or certain medicines, as this is certainly poor treatment for men who serve in the army, especially as some of them serve for twenty-five or thirty years.

Dr. J. S. MARSHALL (closing the discussion). *Mr. President, ladies and gentlemen:* I thank you most sincerely for the cordial reception you have given my paper. I have tried to put before you a few scientific facts in relation to the prevalence of dental diseases among all civilized nations; but the main object of the paper has been to place before you, and particularly the delegates from foreign countries, the need of dental surgeons in the armies of the world, and also to give you an intelligent idea of the organization of the United States army dental corps as perfected by the military authorities of our government—hoping that, out of this, new interest might be stimulated in foreign countries with a view of organizing similar dental corps for the armies of the civilized world.

I was grieved to hear, however, the statement made by Dr. Ottoby. I consider Dr. Ottoby my friend and have considered him a friend of the dental corps, and therefore I do not think that he would

do us a wrong knowingly. I think that he has been misinformed in relation to the character of the service rendered by the dental corps of the army; I am positive that some of the charges he makes are not correct. It has been my privilege to go over the records of the professional work of the corps from its organization up to the present time, and I have been commissioned by the Surgeon-general to make up the reports which he has incorporated in his report to the Secretary of War. I know positively that the only effort that has been made to make a "big record" on the part of the dental surgeons in the Philippines has been to render the greatest amount of service possible, and not only service such as he speaks of, but a service aimed to relieve suffering and conserve the teeth. If you were to go through the records of the corps at Washington it would become evident that the greatest amount of service rendered was of an emergency character, such as the treatment of pulpitis, dento-alveolar abscess, gingivitis, stomatitis, pyorrhea alveolaris, and large contour fillings. That is the kind of service which has been rendered, and I am proud, gentlemen, that the corps has made such a fine record. Our dental surgeons frequently work far beyond the hours prescribed by the army regulations in order to take care of these emergency cases. I know of many instances where they have worked from eight o'clock in the morning until five or six o'clock at night—and army regulations do not require their services except from nine o'clock in the morning until four in the afternoon. Many instances can be mentioned of this kind, and also where they only take fifteen or twenty minutes for lunch in order to meet the pressing need for their services. That is the kind of service that is being rendered by the United States army dental corps.

Criticism has been raised against the War Department with regard to the kind of filling materials furnished. Now, when this corps was organized I had a personal interview with the Surgeon-general and asked him what he expected the corps to do. He said, "We expect

you to relieve men from suffering and fit them for duty." I asked him what kind of materials he expected us to use; if gold fillings would be expected or required. He said, "Dr. Marshall, let me ask you a question. Do you suppose that you will find many men in the United States army who, if gold were used in their teeth and their teeth put in good condition, but what it would cost the government fifty or more dollars per man to do that work?" I answered him that I did not think he would find many cases that would cost less than that to put their mouths in good condition. And my experience in the service corroborates the view then expressed. The Surgeon-general then said, "If it is true that it would cost that much, or even considerably less, the government would not sanction this kind of service, for the reason that the greater number of enlisted men enter the service for three years and the majority of them go out when their enlistment expires." He said it would be our duty to save the teeth by the means placed in our hands; to so treat the men as to render them fit to perform military duty, and when we had done that we would have done all that was expected of us. We, however, went further than that, and did as much gold work for the

officers (who enter the service for life) as we could prevail upon them to have done. With the men who are enlisted for only three years we do the best we can to save the teeth with the materials furnished us by the government. We try to do the greatest good to the greatest number. The Supervising board have instructed the dental surgeons that their first duty was to save teeth, to treat as many as possible, and relieve from suffering as many as possible. And, gentlemen, these instructions have been faithfully carried out. We have done our very best, every man of us; of that I am sure, and more than this could not reasonably be asked of us.

There were some other questions that I wanted to answer, but the time is short, and I think I have said sufficient. (Applause.)

Dr. J. Y. CRAWFORD. I would like to ask, Mr. President, unanimous consent of this body to refer Dr. Godon's resolution to Dr. Donnally's committee.

The PRESIDENT. If there is no objection the resolution will take that course.

There being no further business before the house, the President declared the meeting adjourned until 10 o'clock Friday morning.

Third General Session—Friday, September 2d.

THE third general session of the Fourth International Dental Congress was called to order at 10.45 A.M. by Dr. H. J. Burkhart, chairman.

The CHAIRMAN. Is the Committee on Resolutions ready to report?

Dr. CRAWFORD. Mr. President, your Committee on Resolutions would ask unanimous consent that Dr. Jenkins be permitted to present a resolution, and, immediately following that, your committee would ask unanimous consent that Dr. Williams Donnally be permitted to make a report upon a subject which was referred to his committee by special order; your chairman will then be ready to

report on the proceedings of the Committee on Resolutions.

Dr. JENKINS read the resolution in regard to Consul-general Worman, Munich (see committee report, page 1044).

The CHAIRMAN. This resolution under the rules will go to the Committee on Resolutions.

Dr. DONNALLY then read a report of the Committee on Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World, and the resolution which here follows:

RESOLVED, by the Fourth International Dental Congress, a body organized under the auspices of the directory of congresses, Universal

Exposition, St. Louis, 1904, that it is the sense of the 1600 delegates representing England, France, Germany, Austria, Russia, Spain, Italy, Japan, China, the United States, and other countries, that it is the duty of every government, for humane, hygienic, and economic reasons to provide, in connection with its military medical service, an educated and adequate dental service to aid in conserving the health, comfort, efficiency, and martial spirit of its country's defenders; and be it further

RESOLVED, That the President of this the Fourth International Dental Congress is hereby authorized to appoint an international committee, consisting of one representative from each country, whose object it shall be to secure governmental provision for an educated and efficient dental service to military and naval men wherever practicable; and that this committee, when organized, shall operate under the supervision of the International Dental Federation.

Dr. CRAWFORD then read this report:
Mr. President, and Members of the Fourth International Dental Congress:

Your Committee on Resolutions begs to report the following:

At its first meeting Dr. Chas. Godon, president of the International Dental Federation, presented a report from the International Dental Federation embodying the rules, regulations, and by-laws of the International Dental Federation. Your committee would recommend the adoption of the report on the rules and regulations recommended for the government of future international dental congresses, and that they be concurred in.

With reference to the future work of the F. D. I. the following resolution was adopted:

"RESOLVED, That this committee, in view of the splendid work accomplished by the F. D. I. in harmonizing national ideas upon questions of legislation, education, and public dental service, affirms its belief in the utility of a second period of its activity, and recommends that the Fédération Dentaire Internationale be continued for a second period until the opening of the Fifth International Dental Congress under the following rules and regulations, to wit": [See DENTAL COSMOS for November 1904, page 929.]

We also recommend the adoption of the following:

"RESOLVED, That nominations for the offices of president, secretary-general, and treasurer of international dental congresses shall be made by the Committee of Organization, and that election shall be made by the members of the congress at its opening session."

In pursuance of the regulation in the new code of rules of the International Dental Federation providing for an Executive Council of fifty members, we recommend the election of the following to membership in the council. These recommendations are made upon the recommendation of the Council of the F. D. I.:

United States (5): B. Holly Smith, William Carr, Edward C. Kirk, A. W. Harlan, and Burton Lee Thorpe.

Great Britain (5): (To be appointed by the B. D. A.)

Russia (3): Drs. Klingelhoefer, Ayarapaa, and Totwen.

Germany (5): Drs. Miller, Hesse, Schaeffer-Stuckert, Hielscher, and Walkhoff.

Austro-Hungary (3): Drs. Weiser, Zsigmondy, and Arkövy.

Spain (2): Drs. Aguilar and Portuondo.

France (5): Drs. Godon, Sauvez, Martinier, Roy, and Pont.

Italy (2): Drs. Guerini and Angelo Chiavaro.

Switzerland (2): Drs. Bryan and Guye.

Holland (1): Dr. Grevers.

Belgium (1): Dr. Rosenthal.

Portugal (1): Dr. Cortereal.

Sweden (1): Dr. Förberg.

Norway (1): Dr. Smith-Housken.

Denmark (1): Dr. Haderup.

Cuba (1): Dr. Weber.

Australia (1): Dr. Merrill.

Canada (1): Dr. A. E. Webster.

Japan (2): Drs. Chiwaki, Enomoto.

Mexico (1): Dr. Rojo.

Brazil (1): Dr. Chapot-Prevost.

Argentine Republic (1): Dr. Etcheparaborda.

Chile (1): Dr. Valenzuela (director of the Dental School of Santiago).

Colombia (1): (To be appointed.)

Uruguay (1): Dr. Burnett.

With regard to countries not represented in this list, the committee adopted the following resolution:

"RESOLVED, That the Executive Council shall have the power to add to its number upon the application of any country not having representation."

Your committee recommends the adoption of the following resolution from Section IV, proposed by Dr. Godon:

"RESOLVED, That public dental services should be organized in hospitals, schools, factories, etc., and wherever the poor are medically treated, that they may receive not only urgent medical and surgical attention (whether as to dressings, consultation, tem-

porary fillings, or extraction) but that so far as possible thorough treatment be given to restore the dental organs by means of the resources which modern dentistry affords and such as is employed in the private practice of dentistry and as is the case in the dispensary practice of general medicine and surgery. That is to say, not emergency treatment only, but thorough dentistry is demanded for the poorer classes.

We also recommend the adoption of the following resolution, offered by Dr. Aguilar:

"Whereas it has come to the knowledge of the Fourth International Dental Congress that at the Fifteenth International Congress of Medicine to be held in 1906 at Lisbon, Portugal, no provision has been made for a section on Odontology and Stomatology; and

"Whereas the suppression of this important section, which in the past international congresses of medicine has contributed largely to the advancement of medical knowledge, would be a serious injury to the profession which it represents; therefore be it

"RESOLVED, That the Fourth International Dental Congress requests the committee of organization of the Fifteenth International Congress of Medicine to take into consideration the importance of odontology and stomatology as a department of medical science and art, and make such provision as will maintain its representation as heretofore."

Your committee would also recommend the adoption of the following resolution offered by Dr. Truman W. Brophy, chairman of the Committee of Education, Nomenclature, Literature, and History of the Fourth International Dental Congress:

"RESOLVED, That an International Commission be appointed by the F. D. I. for the next period, upon International Nomenclature and the preparation of a list of professional terms which shall be interchangeable and translatable into English, German, French, and Spanish; to report at the next international dental congress."

Your Committee also recommends the adoption of the following resolution, proposed by Dr. Jenkins:

"Whereas, James H. Worman, Consul-general of the United States at Munich, has for several years, in a spirit of complete disinterestedness and at great personal expense, carried on a successful campaign against bogus dental diplomas, and has also made great efforts to secure international comity in regard to reputable dental degrees; and

"Whereas, in all this labor he has received

the constant sympathy and support of the government of the United States; therefore be it

"RESOLVED, That the Fourth International Dental Congress presents its thankful acknowledgments to the United States Government and to Consul-general Worman, and expresses the hope that Consul-general Worman will not abandon the European field, but will still continue to give the cause of international comity in legitimate dental degrees his powerful support."

The Committee on Resolutions heartily indorses the labors of Dr. Wms. Donnally in this country in the direction of obtaining proper dental services for the army and navy, and recommends the adoption of the resolution which has been offered by the gentleman himself.

J. Y. CRAWFORD,	J. A. CHAPPLE,
CH. GODON,	J. W. DAVID,
FLORESTAN AGUILAR,	N. S. JENKINS,
L. C. BRYAN,	E. SAUVEZ,
L. D. SHEPARD,	J. S. MARSHALL.

Dr. CRAWFORD. Your committee recommends the adoption of the following as an addition to what was suggested by the Federation and which you heard at our opening meeting. (Reading the resolution, embodied in the foregoing report, from Section IV, by Dr. Godon, in regard to organizing dental service in hospitals, schools, factories, etc.)

The CHAIRMAN. The question is on the adoption of the resolution just read by Dr. Crawford.

Dr. A. H. PECK, Chicago, moved the adoption of the resolution, which was seconded, and the resolution was adopted.

Dr. CRAWFORD next read the resolution in relation to the Fifteenth International Congress of Medicine to be held in 1906 at Lisbon, Portugal, as contained in the report.

The CHAIRMAN. What will you do with this resolution?

Dr. A. H. PECK, Chicago, moved the adoption of the resolution, which was seconded, and the resolution was adopted.

Dr. CRAWFORD. Your committee would also recommend the adoption of the resolution offered by Dr. Brophy.

Dr. E. C. KIRK, Philadelphia, moved its adoption; the motion was seconded, and the resolution adopted.

Dr. CRAWFORD. The next resolution that is embraced in the report which was provisional, was in reference to the matter referred to in Dr. Jenkins' resolution. The committee recommends the adoption of the resolution as read by Dr. Jenkins.

It was moved that said resolution be adopted; the motion was duly seconded, and the resolution was adopted.

Dr. CRAWFORD. The Committee on Resolutions heartily indorse the labors of Dr. Williams Donnally in this country in the direction of obtaining proper dental service for the army and navy, and recommends the adoption of the resolution that has been presented by Dr. Donnally of Washington, D. C.

It was moved and seconded that the resolution be adopted. Carried.

Dr. CH. GODON, Paris, France, moved that a vote of thanks be extended to all the officers and members of the International Dental Federation in foreign countries and in America who have given their support to the Executive Council of the F. D. I. during the past four years.

The motion was seconded and carried unanimously.

Dr. CRAWFORD asked the unanimous consent of the convention to call a conference of the Committee on Resolutions in the rear of the platform. There being no objection, consent was granted.

Dr. E. C. KIRK, Philadelphia, read an official communication addressed to the president and members of the Fourth International Dental Congress from the Central Verein Deutscher Zahnärzte respectfully inviting the members of the Fourth International Dental Congress now convened, to hold the Fifth International Dental Congress at Berlin, Germany, in connection with the celebration of the fiftieth anniversary of that society.

Dr. E. C. KIRK. In view of this communication, Mr. President, I offer this resolution:

RESOLVED, That when we adjourn, we adjourn to meet as the Fifth International Dental Congress in Berlin, Germany.

Dr. TRUMAN W. BROPHY, Chicago. I take pleasure in seconding that motion. The motion was unanimously carried.

Dr. CRAWFORD. Mr. President, in connection with the report that was made recently from the International Dental Federation which contemplated the idea of creating an official board of members of the Federation to be composed of fifty persons appointed by this congress, with the various national apportionments, commencing with the highest number, five, and ending with the lowest number, one: When your Committee on Resolutions perfected its report that list had not been completed so far as this organization is concerned by the naming of the men from the United States. They have since been elected in this hall this morning, and I have asked unanimous consent that the names of the members thus elected in conformity with the request of the Federation, be added. Now then I have asked Dr. Godon, as he is more familiar with the names in foreign countries, to read the list, for your formal ratification.

Dr. E. C. KIRK, Philadelphia, read the names of the members from the United States, as follows: Dr. Thorpe, Dr. Carr, Dr. Harlan, Dr. Kirk, Dr. B. Holly Smith.

Dr. CH. GODON, Paris, read the names of the members from all foreign countries.

Dr. CRAWFORD. I now move the adoption of our report.

The motion to adopt the report was seconded and carried.

Dr. CRAWFORD, chairman, asked for a conference with the members of the Committee on Resolutions.

The CHAIRMAN. Please give your attention to the report from the Program Committee.

Dr. A. H. PECK, Chicago. Mr. President, the Program Committee recommends for reading before the general body the essay of Dr. Eugene S. Talbot, of Chicago, which in the contest for prizes received honorable mention, the subject being "Anatomic Changes in the Head, Face, Jaws, and Teeth in the Evolution of Man."

The CHAIRMAN. Ladies and gentlemen, I have the pleasure of introducing to you Dr. Talbot of Chicago.

At this point, at the request of the chairman, Dr. Burkhart, Dr. Florestan Aguilar, Madrid, Spain, presided as honorary chairman.

Dr. EUGENE S. TALBOT, Chicago, Ill., then read his paper entitled "Anatomic Changes in the Head, Face, Jaws, and Teeth in the Evolution of Man." (Printed in full at page 897 of the November issue of the *Cosmos*.)

Discussion.

Dr. J. G. KIERNAN, Chicago. The conception of health as an entity is a part of the erroneous conception of the body as an entity instead of as a compound organism. Not only does the body have certain potentialities of development which are expressed at the periods of stress, but all organs retain both embryonic and post-natal potentialities which are neither macroscopically nor microscopically demonstrable even by the finest methods. Health being a balance and dependent on the disposition of assimilable nutriment, and this balance being dependent not only on environment but on environment as affecting either embryonic or post-natal potentialities, it is a matter of mathematical demonstration that if embryonic potentialities once active for the benefit of the organ, and now latent for the benefit of the body as a whole, be stimulated at the expense of post-natal potentialities, conditions destructive of the normal balance must occur.

For this reason, as Dr. Talbot has shown, great variations occur in structures which have been variable in embryogeny and post-natal development. The face and jaws have varied enormously in mammalian development. The same is true of the teeth, as the slightest study of the subject will show. The variations within the limits of health, although constituting a pathologic factor, are sometimes enormous. To a certain extent, as Dr. Talbot has shown, the normal enlargement of the lower jaw from the small embryonic type may be exaggerated at the expense of the rest of the face while leaving the rest of the body unaffected. Developmental pathology not

only underlies proper embryogeny but likewise most surgical problems.

Dr. C. L. HUNGERFORD, Kansas City, Mo. I would like to say just a word. I would like to have the members of the congress ask themselves, Toward what does this paper tend? So far as I see it is an *exposé* of isolated facts. From these malformations is drawn the conclusion that man evolved from the anthropoid ape, or the Aryan race came from the negro or the Chinese type or some other type. I wish I might be permitted to change one expression, and instead of saying a degenerate, say a degenerating race—as the negro is a degenerating race: so also is the Chinaman, the Alaskan Indian, the earlier aborigines of Australia; Spain is degenerating, and so is France; England is on her decline; various races rise and fall; America is a rising race, so are the Cubans and Japanese. To start with a point as degenerate, as I understood the essayist, and work back toward the anthropoid ape is only an argument that controverts the theory of evolution of man from the ape, showing that man can degenerate toward the ape, but not that he came up from them. The greatest of our scientists today in anthropology have decided that the Caucasian or Aryan race and the highest type of human development never evolved from the anthropoid ape, but that the anthropoid ape is a degenerate human being. Not only is that accounted for by all science, but in all history, in all scriptures, and in all knowledge with which I am conversant. There are types that may have reverted as the result of miscegenation, but this is no proof of evolution.

The majority of these illustrations are simply malformations from hereditary and other causes. They are not true degeneracy, for that is a slow process and can only affect races, not individuals.

I did not gather just what the essayist was trying to prove. He simply illustrated certain facts, which seemed to me to tend toward the idea that man was evolved from the anthropoid ape—an idea that I most seriously wish to controvert. I do not believe it, and I have the

authority of every great scripture of the world and the greatest scientists living today. There is no such thing as evolution of a lower to a higher, unless the higher is in the lower. You cannot take ten gallons out of a five-gallon jug; you cannot evolve an ape into a god, unless the ape has a god in him; but a god can degenerate and lose his godhead and become an ape. An ape cannot become a man, not in ten million million years; and nobody ever believed it except those men who are so wedded to what might be called "text-book authority" that they are afraid of their own opinions and their own thoughts, and afraid to give to their own investigations their natural conclusions. They stick like women to the existing order, but thank the Lord that existing order has had such a volcano under it in the last three or four years that there are very few men today who are well posted in anthropology who believe in evolution of the white race from the anthropoid ape.

It is not evolution, but a mental, moral, or physical perversion of the subject or his immediate ancestors that has caused these various forms that have been illustrated. How do they take place? Here is a man with a receding chin, with a sunken nose and forehead. Nature gives expression to the soul within a man in her outward manifestation of him: when beauty takes its departure from the human face, the human face shows the way that that beauty went, whether dissipation, sensuality, or drink. When Nature expresses her thought, her divine thought, it is in the highest physical objective type in which she can find lodgment, and when she has a degenerate soul behind it she exhibits a degenerate body, and builds one in conformity therewith. The wayside flower has its little soul developed so far as it can express itself, and the higher type of flower or animal expresses its soul in its form; and when you find faces, perhaps beautiful in their childhood, now crooked, receding, sunken, blotched, and sallow, you know somewhere in that man's life his thoughts have so far retrograded that nature has stamped upon his face the true expres-

sion of what that soul is. There is no secret but what shall be revealed, and we reveal our character in our thoughts every day as we build them in our physical cells and show them up in our faces. (Applause.)

Dr. H. J. Burkhart here resumed the chair.

Dr. A. H. THOMPSON, Topeka, Kansas. This paper of Dr. Talbot's is an important contribution to the subject of the degenerating evolution of the face with which he has made us familiar. It is along pathological lines that he really has advanced now, and I hope that we may continue to have studies contributing to the closing of what might be called the gap between cause and effect in which neurasthenia affects the development of the face. These degenerate conditions are, of course, the result of retrogressive change, using the word "evolution" in its broadest sense. The result of this retrogressive evolution today is the reduced structure of the face, which is in fact in embryo, and is more properly called infantism because it stops at that stage and does not progress to full development as found in earlier primate forms.

The CHAIRMAN. If no one else desires to discuss the paper, I will ask Dr. Talbot to close.

Dr. E. S. TALBOT. I regret very much that it will be impossible for me, in the few minutes I have, to elucidate. It is one of the hardest things in the world to make a person who has not given much thought to this subject understand exactly what it meant by degeneracy. A person may have a degenerate brain; he may have an arrested development of brain. What is generally termed a degenerate may be a criminal, a thief, a liar, and so on. But we have degenerate structures. Man cannot evolve, he cannot develop, without losing some structures and having others develop; hence the vermiform appendix is an organ that is passing; the pituitary gland, the small ribs, the little toes, the little muscles of the ears are not being used, and therefore nature is getting rid of them for higher mental development. They are degenerative structures. It is the brain

that is developing in the human race, or, as the gentleman said here, certain nations have become arrested and they are dying out. I have not time to explain it, but he is quite right about that—that a nation will go on to a certain period and if there is no new blood infused into it from other nations that nation will soon die out; if it takes a thousand years, or perhaps two thousand years, nevertheless it will do it. But here in America we have an advantage over any other nation of the globe; individuals are pouring in from all over the world, and we are intermarrying and furnishing new blood, and for that reason the brains are developing in this country, which up to a certain time, as soon as immigration ceases, and we intermarry among our own relatives, as noticed in the nobility of Europe, will then bring about mental degeneration.

But, on the other hand, the face—the teeth are not being used, the face is not being used, the eyes are not being used, the nose is not used, and that is the reason why the face is degenerating for the benefit of the brain. We usually do most of our work by machinery now; we do very little of it by hand. We do not gnaw upon trees with our teeth as the lower animals do, for instance; but the brain is developed, our work is being done by machinery, and the physical part of the human body is degenerating. We are going on in a higher evolution, and that is the reason why degeneration of the face is going right on; that is why we have irregularities of the teeth; we are going right on all the time. We are not stopping decay of the teeth in the race; we are only stopping it in individuals; we are not stopping it as a nation or as a family. Every generation that comes into this world will have more decay of the teeth than the generation before. The same is true with the irregularities of the teeth. They are going to become more prominent as we ascend the scale of evolution, because of the recession of the jaws, and because we do not use them.

This is a proper conception of the whole subject. We have to contend with decay of the teeth, with irregularities of the teeth, with interstitial gingivitis; and all

of these conditions are based on this law of economy of growth. The structure of an organ is lost for the benefit of the organism as a whole. Now, then, where a parent or a child has a nervous condition we get this arrested development. It may be due to going to parties too much of evenings and sitting up nights and sleeping in the daytime; it may be due to overwork; it may be due to disease that is inherited. If, however, the mother be a strong, healthy woman she may be able to ward off these conditions that we are called upon to treat. If, on the other hand, her nervous system is unstrung and the child does not get proper nourishment, owing to an unstable nervous system, then we have all these conditions to which I have called your attention. Now that is a general outline of the subject, as I cannot go into details for want of time. I thank you very much. (Applause.)

The CHAIRMAN. Ladies and gentlemen, I have the pleasure of presenting to you a distinguished guest from Brazil, Dr. Houston.

Dr. J. FRANK HOUSTON, Rio Janeiro, Brazil. Gentlemen, at the instance of some members of the congress and of your worthy president I have consented to attempt to say a few words to you in regard to the great country from which I come. I have had the pleasure of being in Brazil about twelve years, and I frequently tell my friends in this country that if the Puritan fathers who came to New England had gone to Rio Janeiro, the great and beautiful harbor on the south coast of the Atlantic, instead of to Boston, that place would have become the garden spot of the world today. My greatest regret today is that the American dentists who are in Rio Janeiro were so indifferent to the great meeting that is being held at this time here; they did not unite as they should have done and make an attempt to present to you something of the conditions which exist in that great country, which I am sure would be of much interest to many of you, because it is a field open for the dental profession and for all the professions. Anyone of ability who goes to that country will make a great success.

I regret also very much that I am not an orator so as to be able to give you something of interest in regard to that country. On behalf of the American dentists in Rio Janeiro I wish to thank all of the noble men of our profession for the great work which they have done in this great organization, and for the advancement which they have made and of which we shall reap many results. I thank you. (Applause.)

The CHAIRMAN. I now have the pleasure to present to you Dr. Bryan, who will preside during the reading of the paper of Dr. Guerini of Naples, Italy, which will be read by Dr. E. C. Kirk.

Dr. KIRK. I wish to make an explanation in regard to this paper, at Dr. Guerini's request. It is a portion of a report to the congress committee on History. That report is a very voluminous one; it is reported in the section presided over by Dr. Brophy, and to Dr. Guerini of Naples was assigned the task of contributing an essay upon the contributions of the early Italian writers to dentistry. It was a happy choice, because perhaps no one on the continent of Europe is more qualified to speak upon that theme, or upon the question of ancient dentistry in general, and the result has been considered to be of such especial interest and merit that the communication was ordered out of the section to be read here before you in general session.

Dr. Kirk then read the paper by Dr. VINCENZO GUERINI of Naples, Italy, and entitled "Italian Writers upon Dental Science and Their Works." (Printed in full at page 1010 of this issue of the COSMOS.)

Discussion.

Dr. BRYAN, chairman. Gentlemen, you have heard the very valuable paper of Dr. Guerini, in which he gives us some most interesting points. Are there any remarks to be made on this paper?

Dr. CHAS. McMANUS, Hartford, Conn. Allow me to take the privilege of saying that we have listened to a very masterly paper by a very highly educated gentleman from Italy. He is an authority on a subject of great interest to an interna-

tional congress. I desire also to say that this distinguished man has followed out his early work in the history of dentistry among the ancient peoples of Italy, and has now carried on his careful investigations through a more modern period, bringing it down to the present day. If it be possible for him to continue his work and show us the history of dentistry during that almost unknown period of the middle ages he will have made an almost complete history of the dentistry of his country. American dentists will have to wait many years before they will be able to do the same for their own country.

Dr. TRUMAN W. BROPHY, Chicago. I would like to say that the author of this paper, Dr. Guerini, has taken the pains and gone to the expense of bringing to this congress an exhibition of ancient dentistry which I believe will be a revelation to many of those who have labored under the impression that fixation of teeth in the form of bridges is a comparatively modern art, and I trust that those who have not taken advantage of examining this very notable exhibition, which may be found on this floor, will do so. They will probably never have another opportunity to see the work of the Etruscans, dating back to a time which I cannot name, but far back in ancient history—showing that dentistry is not by any means a modern art, but antedates by many years the beginning of the Christian era. (Applause.)

Dr. L. P. HASKELL, Chicago. The Etruscan art extends back 2500 years. I have seen several of Dr. Guerini's specimens; it is practical bridge work—and bridge work, you know, is the most recent production of American art; but when you go back 2500 years we find practical bridge work done by the ancients.

The CHAIRMAN. Any other remarks?—if not the paper will be passed.

Dr. EMMA EAMES CHASE, of St. Louis, Mo. Before closing with the paper I would like to make this motion:

RESOLVED, That the Fourth International Dental Congress present its compliments and thanks to Dr. Guerini for bringing this valu-

able collection of historical dentistry, and for his very valuable addition to the history of dentistry.

The motion was duly seconded and unanimously carried.

Dr. VINCENZO GUERINI, Naples, Italy. I cannot speak English very well, you know, but I would say a few words. I am very glad to see that my communication is well accepted, and I thank you very much for the kind words you have said about me and my work. (Applause.)

Chairman H. J. Burkhart here resumed the chair.

Dr. CRAWFORD. The Committee on Resolutions has a supplementary report

to offer. There has been referred to the committee a communication from Section IV in reference to the matter of looking after the instruction of the school children of the nations of the earth, and we concur in the sentiments expressed in the resolution, but as it has been provided for in the work of the Federation in the reports on the subject of education, the committee ask that it be referred to the Federation for their supervision and management.

The CHAIRMAN. If there be no objection it will take that course. Hearing none, it is so ordered.

The general session then adjourned until September 3d, at 10 A.M.

(To be continued.)

SECTION I: Anatomy, Physiology, Histology, and Microscopy.

FIRST DAY—MONDAY, AUGUST 29.

THE section was called to order on Monday, August 29, 1904, at 2 P.M., by the president, Dr. M. H. CRYER, who read the following address:

Gentlemen of Section I: It gives me much pleasure to welcome the members of this section of the Fourth International Dental Congress, and to express my great appreciation of the honor of presiding over so representative a body of men. While our section, from its purely scientific nature, may not attract very large numbers, we are more than compensated by the high quality of the papers which have been prepared for us by men whose achievements entitle them to speak with authority upon their special work.

We have reason to feel encouraged over most of the work within the province of our section. During the past few years much new and valuable information has been brought to the attention of the dental profession concerning the anatomy, histology, and microscopy of the oral cavity and the parts directly associated with it. In the branch of physiology I feel that the dental profession has a wide and promising field for scientific research.

In most of our colleges physiology is taught by medical men, and the latest books upon the subject are written by medical men. It is to be deplored that more of the chairs are not filled by men who have given special consideration to the physiology of the mouth, as the general physiologist cannot give to it the attention it justly deserves. There is little doubt that investigations on the oral cavity from a physiological standpoint would be of the highest value to dentistry and to the race at large.

The prime object in a thorough knowledge of anatomy, histology, and physiology is the better understanding of pathology. Without a thorough knowledge of these, neither medical nor surgical treatment can be judiciously carried on. A vast improvement in the method of teaching anatomy has been brought about through the minute sectionizing of the cadaver and the introduction of the Roentgen rays with their revelations of the internal structures in the living subject. Special and general surgeons are no longer satisfied with the old stereotyped lectures and text-books on the subject; these and the old, irregular dissecting-room methods have become antiquated since the surgeon has found so

large a proportion of his mistakes due to the non-practical knowledge he obtained in his college.

In the region of the head and face the work of Zuckerkandl of Leipzig (in 1893), Dr. A. Quodi of Budapest (in 1895), Turner of Scotland, and Frazer of Ireland, have done much in bringing to light facts which were before hidden. The rhinologists of America have also done considerable sectionizing of this region, demonstrating the relations of the orbit, the ear, and the throat to the oral cavity.

Comparison of notes among laryngologists, otologists, rhinologists, and dentists, showing the essential correspondence of the results of this kind of dissecting in their various lines, brought these various men together for consultation. It is no longer uncommon to see dentists taking part in medical societies and to have medical men reading and discussing papers before our dental meetings. The program for this section contains the names of men who have become famous not only in their own profession but in the medical profession generally, and whose names are indelibly registered among those of investigators.

In what might be termed dental anthropology, the dentist has contributed important ideas upon the shapes and forms of the teeth of the races of men in the past as well as the present. He has also done much in the study of the face in its aberrations from the forms that might be termed typical through the various phases of deformities arising from degeneracy.

In histology and microscopy we have the work of Miller of Berlin and Leon Williams of London, and the fine contributions of Caush of Brighton and others—all of the greatest value and reflecting much credit upon the dental profession.

As our profession becomes older it will inevitably grow more scientific in its trend of thought. With the higher standards thus created our department of its work will attract a relatively large number of the men who will devote themselves to original research, which in turn

will aid the practical dentist in the betterment of his practice and the more scientific working out of his methods.

When every department of dentistry feels the quickening impulse to better, more thorough work, we may look for the highest perfection of dental service. The theoretical acting upon the practical will suggest improvement, the practical will confirm the theoretical, and scientific dentistry will be the result. To the end that this much to be desired goal may be reached the sooner, it is to my mind desirable that the intending student shall have a broad education on general lines. Then it would seem that four years would be little enough to acquire the practical mechanics of dentistry and the thorough drilling in anatomy, histology, chemistry, physiology, bacteriology, and pathology—in their general and in their special aspects—which I conceive to be necessary to fit a man to properly grapple with the diversified problems of practice.

In closing, I wish to present to this section a message from my dear friend and preceptor, Prof. Thos. C. Stellwagen, who is unable to attend the congress, and for whose opinion we all have the greatest respect. It is as follows: "I beg you to remember me to the many true men who are struggling so valiantly and so successfully for the elevation of our beloved profession. Say to them for me, that as the scouts of an army should have the means of observation and judgment to appreciate the force of the enemy, so the dentist must be educated and capable to diagnose diseases that so frequently find entrance to the general system and also leave their foot-prints upon it through the oral tissues."

Discussion.

Dr. FLORESTAN AGUILAR, Madrid, Spain. We have had the pleasure of hearing the brilliant address of Dr. Cryer. Any words of praise that I might use concerning him would be inadequate to express the sentiments of admiration that I have for my professor, whom we all know to be one of the benefactors of the dental profession, and not only of that profession but of the medical profession

at large. His beautiful anatomical work has been reported in the proceedings of various dental and medical societies. I do not know if it be in order to discuss the present address, but as I am temporarily occupying the chair I will take the liberty of asking if any gentleman wishes to make any remarks on the address. If not Dr. Cryer will resume the chair.

The President then called on Dr. FLORESTAN AGUILAR, Madrid, Spain, to read his paper, as follows:

SOMNOFORM: ITS PHYSIOLOGICAL ACTION AND ITS ADMINISTRATION.

Everything tending to the alleviation of pain is of such importance to those devoted to the practice of dentistry that we observe with a marked degree of interest anything pertaining to the fields of general and local anesthesia. The discovery of Dr. Rolland, director of the Dental School of Bordeaux, of the mixture which he has named *somnoform*, and which consists of ethyl chlorid 60 per cent., methyl chlorid 35 per cent., and ethyl bromid 5 per cent., I consider to be one of the most important clinical discoveries of modern times. At the congress of the Association Française pour l'Avancement des Sciences held in 1901, Dr. Rolland presented for the first time an essay on somnoform, accompanied by clinical demonstrations. Since then its use has been largely generalized in Europe, where over 25,000 patients have been anesthetized by Dr. Rolland himself. These cases, together with others recorded at the hospitals of England and France and in the medical department of the University of Madrid, constitute a total of over 100,000 cases in which the properties of this anesthetic have been tried.

A series of 100,000 favorable cases confirms without doubt the satisfactory laboratory experiments previously carried out, showing conclusively the advantages of this agent over chloroform and nitrous oxid, from the minimum of danger incurred by its administration when employed for brief anesthesia.

Upon the brilliant studies undertaken

by Dr. Rolland, and the writer's own experience and investigations in the laboratory of physiology of the University of Madrid, the notes have been prepared which I now have the honor of submitting to your consideration and discussion.

In order that an anesthetic should enter the respiratory tract and act on the nerve centers, it must be in the gaseous form; and the rapidity of its absorption is in direct ratio to its degree of diffusibility. This is the force which causes the blood corpuscles to become saturated with the narcotic vapors instead of with oxygen; therefore the action of the gas on the nervous system will be rapid in proportion to the rapidity of saturation. Dr. Rolland presents the problem of anesthesia in the following propositions:

First: To produce anesthesia it is necessary that the tension of the anesthetic gas be superior to that of oxygen, so that it may in a certain proportion, take the place of the latter in the pulmonary alveoli.

Second: The tension of a gas being proportionate to its volatility, the more volatile the gas is, the easier can it be made to take the place of oxygen.

Third: The ideal anesthetic, if such be attainable, would be the one behaving in its conditions of entry, of sojourn, and of exit from the body, as does oxygen.

If we follow the course of oxygen in the body, we see that the red blood corpuscles, after becoming charged with oxygen in the lungs during inhalation, distribute it to the tissue throughout the body. The blood corpuscles have their period of activity during their course through the arterial system. When the oxygen has been given up, the corpuscles return through the venous system to the lungs in an inert and dormant state; and there by contact with oxygen resume again their former activity. Now, as about twenty-five or thirty seconds are necessary for a red corpuscle after leaving the heart to return to it, we can say that in this diagrammatic division of the circulation in two parts, one arterial and the other venous, the action of the oxygen would last from twelve to fifteen seconds; therefore an anesthetic capable of

being absorbed practically in the same manner as oxygen should produce its effect in about fifteen seconds, and when the administration is discontinued it should be eliminated in proportion, as the corpuscles of the blood come again into contact with the oxygen. This, almost to exact precision, is what takes place with somnoform. In the study of this physiological action we observe that somnoform produces the following phenomena.

ON CIRCULATION.

Somnoform has a powerful action on the sympathetic system, increasing the arterial tension and the frequency of the cardiac contractions. A series of curves of the blood tension taken with the sphygmograph of Marey and the sphygmomanometer of Potain on the radial artery of Dr. Rolland showed in twenty minutes a variation of from $13\frac{1}{2}$ of normal blood pressure to $14\frac{1}{2}$, 17, 17, 13, 14, 15, 14, 14, $13\frac{1}{2}$, during, through, and after the anesthesia. The pulse, which formerly was 76 per minute, presented in the same observation a frequency of 76, 84, 76, 68, 68. Respiration, which when normal was 16 per minute, went up to 28, 20, 19, 20, 20. And a careful microscopical study of the blood of subjects under somnoform showed that the anesthesia of from five to eighteen minutes' duration produced no important modifications in the blood. The urine of the anesthetized persons also remained normal.

THE NERVOUS SYSTEM.

Microscopical studies of the cerebral centers show the modifications produced by somnoform on the neuron. The neuron, as is well known, is the anatomical nerve element, or the nerve cell and its branches, as discovered and investigated by Ramón y Cajal of Madrid, and is composed of three parts: first, a central part which is the real cell, with its protoplasma containing elements with and without peculiar affinity for coloring matter, and its nucleus. Second, a peripheral part made up of protoplasmic branches and the various ramifications

(dendrites), with ends which do not anastomose; and third, the more peripheral part formed by the axis cylinders, which do anastomose.

THE CEREBRUM AND CEREBELLUM.

The investigations were made on the cerebrum and cerebellum of rabbits and cats: first, on non-anesthetized animals (control subjects); second, on the animal at the end of an anesthesia varying from five to fifteen or twenty minutes; third, on animals at the end of a prolonged anesthesia (one hour or more); and fourth, on the animals one hour after consciousness had returned.

The staining of tissue was made by the rapid method of Ramón y Cajal of Madrid, and by the method of vital staining of Ehrlich by the intravascular injection of Gubler's methylene blue.

In the right carotid artery of the animal experimented upon, injections were made every five minutes of from 2 to 10 cc. (or according to the size of the animal) of methylene blue. At the end of a half-hour the brain-case was opened and microscope sections were obtained. The researches were always controlled on non-anesthetized animals.

The changes brought about in the neuron by somnoform differ in the various regions of the cerebrum and cerebellum, also in accordance with the duration of the anesthesia.

FIRST SERIES: SHORT ANESTHESIA.

Cerebral covering. The pyramidal cells with their branches remained normal; they did not change in size. The chromophile granulations of the protoplasm could be clearly seen; the nuclei were normal.

Cerebellar covering. The methods of Golgi and Nissl show the sharp modifications undergone by the cells of Purkinje, a slight deformation and irregularity of shape. The protoplasmic prolongations were varicose. It appears that from the beginning of anesthesia the mixture has a particular action on the nerve elements of the cerebellar covering.

SECOND SERIES: DEEP AND LONG ANESTHESIA.

In this series of experiments the guinea-pigs died at the end of a quarter of an hour or after twenty minutes. Cats, as well as rabbits, resist for several hours. Where fragments of the nerve centers have been removed from the living animal, or from an animal which has just died, the results obtained by examination are the same, and the modifications are as clear in the cerebral as in the cerebellar covering.

Cerebrum.—The cells diminish in volume. The protoplasm presents excessively clear zones, and the protoplasmic branches remain intact.

Cerebellar covering.—The modifications of the cells of Purkinje are very marked. The protoplasmic branches are deformed and present varicosities and knots.

THIRD SERIES: ONE HOUR AFTER RECOVERY.

There was return of all the elements to their normal state excepting the cells of Purkinje, which are slower to regain their normal form.

Speaking of these experiments, Dr. Rolland concludes as follows: "Somnoform has an elective action on the cells of Purkinje, thus suppressing sensitivity to pain and temperature—its passage through the cerebellum; and when there is saturation or excess of the anesthesia the pyramidal cells are impressed, determining loss of consciousness." It only remains to state that the results of this observation show that the minimum of danger is incurred in the administration of somnoform, which during a short operation causes sleep without in any way acting on the cerebral covering. This selective power on the part of certain substances for a definite portion of the nervous system should not be surprising to us. We know, for instance, that chloroform, ether, and alcohol have in their action a preference for the cerebral covering; that cocaine in moderate doses acts on the

peripheral endings of sensory nerves; that strychnin shows a preference for the cellular elements of the anterior columns of the spinal cord; that nicotine paralyzes the nerve cells of the sympathetic ganglia; that curare acts on the motor nerve endings. These experiments show conclusively that somnoform acts first on the cerebellum and secondarily on the cerebrum.

CLINICAL STUDY.

Somnoform, as is the case with any other anesthetic, determines in the patient three well-defined states: First, pre-anesthetic period, or that of induction. Second, anesthetic period, or that of resolution. Third, post-anesthetic period, or that of elimination or return to consciousness.

In each one of these periods we observe two types of phenomena, subjective and objective.

The subjective phenomena in the first period are emotional: a feeling of anxiety, of suffocation, blurred vision, tinnitus aurium, light tickling in the extremities, and the strange sensation of having a warm compress on the cerebrum from the occipital to the frontal lobes.

In the second period, or that of true anesthesia, the patient experiences no sensation whatever.

The third or post-anesthetic period commences by a sensation of far-away buzzing, the reappearance of the sense of hearing, dreams of different types, gay, religious, amorous, professional, etc., generally in relation to the subject of which the patient was thinking immediately before the anesthesia. At first he fails to recognize the place and the persons that surround him, this state being followed by return of motion, with a tickling in the extremities.

Clinical classing of cases. Clinically we can group the patients into three classes as follows:

The first class—embracing 90 per cent. of all cases—is constituted of those patients who are tranquil and unresisting. With a dose of from 3 to 5 cc., in from fifteen to thirty seconds they are anesthe-

tized, and they remain so for from fifty to seventy seconds and sometimes for nearly two minutes. When they regain consciousness they are pleased, and express satisfaction and wonder at the slight amount of inconvenience they have experienced.

The second class will be more difficult to anesthetize. It comprises the restless class of patients who involuntarily resist anesthesia. When the administration begins they fight to get the mask off the face; they swallow but do not breathe, at first; sometimes they cry out, but finally lapse into unconsciousness. These patients are found in the proportion of 8 or 9 per cent.

The third class of patients is constituted of the alcoholic, epileptic, hysterical, and tobacco users. They are difficult to anesthetize, and the elimination of the anesthetic takes place slowly. They are irritable and the anesthetic seems to have on them a hysterogenic action, provoking a nervous crisis. Fortunately, patients of this kind will be found only in a proportion of about 1 per cent.

METHOD OF ADMINISTERING SOMNOFORM.

Always employ a mask or inhaler in preference to a handkerchief or waterproof cone, with which it was originally applied. The inhaler will permit, not only the exact measurement of the dose employed, but also rapid induction by reason of the total exclusion of air—a factor of great importance. After seating the patient with the head in line with the body, explain that deep inhalations should be taken, that the liquid has a slightly irritating odor, and that it will produce a quiet and agreeable sleep, particularly if he can induce himself to think of something pleasant. The pneumatic pad of the inhaler having been inflated and tried on the patient's face, pour the somnoform from the bottle into the chamber of the inhaler in the dose of 5 cc., or the contents of a capsule; close the chamber very rapidly, and instantly apply the face-piece. Generally in about twenty seconds the action of the agent

will begin and the signs of general anesthesia will be evident—namely, cessation of the ocular movements, drooping of the eyelids, dilatation of the pupils, complete relaxation, occasionally rigidity of the arms, and loss of corneal reflex. The induction is complete in from thirty to forty-five seconds, and the anesthesia lasts from sixty to ninety seconds. The pulse slightly increases in frequency and tension, and the color of the face remains completely normal without trace of the cyanosis that appears when nitrous oxid is employed. When recovery of the patient begins, analgesia persists during some seconds, allowing a little more time to operate with the patient in a semi-conscious state. In four or five minutes the patient completely recovers.

In conclusion, I consider somnoform the most valuable general anesthetic in dental practice, from the rapidity of its induction (thirty seconds) and the length of available anesthesia (fifty seconds), from the possibility of administering it to all patients and without special preparation, from its pleasant effects, and from its safety, demonstrated not only by the investigations on its actions on the nerve centers, but also by a clean record of over 100,000 cases.

I may add, gentlemen, that I have here the mask that I have been employing in my practice, and also another mask that, since my arrival in America, I have found is manufactured in this country. As soon as the clinics are organized, tomorrow or the next day, I intend to give a clinical demonstration.

I have brought a patient here this afternoon whom, if the president will allow me, I will anesthetize, so that you can see how quietly the effects of somnoform are produced, and the rapidity with which anesthesia is induced by it. I have used it many hundreds of times in the clinic of the dental department of the University of Madrid. As I say in my paper, Dr. Rolland has a record of over 25,000 cases operated upon by him, and there are additional hospital records in France, England, and Spain, besides pri-

vate cases, which sum up over 100,000 in all.

The manufacturers preparesomnoform either in little glass capsules like this one which I have here, or in large flasks. These little capsules are convenient, because each contains an exact amount and there is no danger of administering too large an amount. The face-piece contains a piece of cotton which absorbs the required amount of somnoform. This can be charged every time a patient is operated on. The pipe is very smooth, and can be washed and made aseptic.

Now, the way in which I proceed in my practice is, as stated in my paper, first to explain to the patient that the liquid has a slight pungent odor, that he should be quiet and confident and should think of something pleasant. I have observed that if at the moment one applies the face-piece reference is made to music, as, "Do you not think you are hearing some nice music; do you not think it is beautiful?" it overcomes the repugnance of the patient, and when he recovers consciousness he has recollections of a musical dream.

Dr. Aguilar then administered the anesthetic to one of the persons present. The total time taken up by the operation was announced as having been three minutes and twenty seconds; the time required to produce the anesthesia, twenty-nine seconds; the duration eighty seconds, while the period of partial consciousness lasted to between eighty and ninety seconds.

Discussion.

The PRESIDENT. Gentlemen, you have heard this very interesting paper and have witnessed the demonstration by Dr. Aguilar. It is a method that has not been used, I believe, in this country so much as in France, England, Spain, and Italy. My observation while in Europe last year was that it was quite commonly administered. In the Philadelphia Hospital it is being used to a certain extent. The paper is now open for discussion.

Dr. MORRISON. I would like to ask

Dr. Aguilar in what cases is the administration of somnoform absolutely contra-indicated.

Dr. SUBIRANA (whose remarks were made in Spanish and were translated by Dr. Aguilar as follows):

Dr. Subirana says that he can speak from the viewpoint of both patient and operator. While at Bordeaux he had occasion to be anesthetized by Dr. Rolland; and while under the influence of somnoform had his hands pierced with a pin and felt absolutely nothing. He was afterward operated on, and he declared himself entirely satisfied. As an operator in Madrid he has recently used somnoform very frequently in his practice with the best results. He insists on the importance of the proper technique in administration. He states that at first he had some failures, but was convinced that they occurred because air was permitted to mix with the anesthetic vapor. He has also used it in connection with chloroform in general surgery, and cites a case which occurred not many days ago where he assisted a surgeon at a hospital, giving at first somnoform and finishing with chloroform, in order to prevent the period of excitement produced by chloroform. By thus commencing with somnoform he obtained much more rapid anesthesia. He says he got one of the physicians to administer somnoform to him. The physician undoubtedly gave him an overdose, and he says that he was dizzy and sick. He thinks this was due exclusively to the excess of somnoform administered to him and to the imperfection of the administration.

Dr. LOSADA. I may add something to what has been said in the discussion of somnoform. I myself have been anesthetized with somnoform half a dozen times at the very least. I find the action of somnoform very similar to that of nitrous oxid; these two are very much alike in their effects. I find this advantage in somnoform, that the technique is much simpler, because you do not have to carry a big gas outfit. As Dr. Subirana says, if you take an overdose of somnoform—and I have been given an overdose twice, I believe—you do not feel

at all well afterward; just as when you take an overdose of gas you do not feel at all well.

Dr. Aguilar has had more practice in the use of somnoform than I have, but my experience has led me to believe that somnoform does not seem to act well on some people. In some cases there is not always a complete loss of consciousness. There is partial anesthesia, but still the patient has some idea that he is alive. In spite of this fact, however, I believe somnoform to be a very useful anesthetic for extractions and minor oral operations. The trouble with all these general anesthetics for me is that their action is very rapid, and sometimes when you have to extract two or more roots it does not give you the time necessary to carry out the operation. That is why in most of my cases I prefer local anesthesia, which does not frighten the patient—at least never so much as does general anesthesia, the effects of which are usually disagreeable.

A MEMBER. It seems to me that this anesthetic has some advantages over gas. The period of anesthesia is a little longer, and there is the advantage of not having a bulky apparatus; and then, too, it appeared to have an analgesic effect after the profound anesthesia had passed. I wanted to ask Dr. Aguilar if it was practicable to use it to obtund sensitive dentin in order to prepare a cavity without causing too severe pain.

Dr. GRIFFITHS. I would like to ask Dr. Aguilar whether it would be safe in cases of difficult extraction of roots, when the operation cannot be completed before consciousness returns, to re-administer somnoform at the same sitting.

Dr. MATTHEWS. I should like to ask Dr. Aguilar to state the external symptoms of somnoform anesthesia, the effect on the pupil, on respiration, and on the pulse.

Dr. LOSADA. They are the same as in any kind of anesthesia.

Dr. AGUILAR (closing the discussion). In answer to the remarks made by Dr. Subirana I can only say that I agree with him as to the importance of properly administering the anesthetic. It is very important to exclude all air when once

the inhalation has begun. If a perfect occlusion of the apparatus with the face be not made, a very imperfect anesthesia will result and a much larger amount comparatively of the anesthetic, and a longer time, will be required to produce unconsciousness. Therefore, with Dr. Subirana, I likewise insist upon the importance of a total exclusion of air during the administration of the gas. I may also say that it is true, as he has stated, that you can produce a very agreeable chloroform or ether anesthesia by beginning with somnoform, overcoming in this way the excitement period of ether or chloroform anesthesia.

In regard to the remarks made by Dr. Losada, I may say that I have not found that some patients cannot be anesthetized with somnoform. If you will recollect, I said in my paper that there are alcoholics and epileptics who manifest a resistance to the action of somnoform, and upon whom it produces an hysterical effect. That is, it provokes a nervous crisis, just the same as in the case of chloroform or nitrous oxid. You have all doubtless found in the administration of nitrous oxid that some patients exhibit a state of violent excitement. Happily I find the proportion of that class of patients in my practice to be only about one per cent. I have made these computations after consultation with Dr. Roland, whom I saw before I came here. He also stated that in his experience, covering 25,000 administrations only, about one per cent. of the patients are very difficult to anesthetize with somnoform.

Dr. Griffiths has asked if it be possible to re-administer the anesthetic; that is to say, in the case of several extractions, if the patient returns to consciousness before the operation has been completed. I have done that on several occasions without any bad after-effects.

In regard to the question as to which were the cases in which I considered somnoform anesthesia contra-indicated, I may say, in very marked valvular disorder only.

I may also say that one of the best advantages of somnoform is that it pro-

duces absolutely no change in the appearance of the face, which remains perfectly normal.

SECOND DAY—TUESDAY, AUGUST 30.

The section was called to order at 2.30 P.M., by the president, Dr. M. H. Cryer.

Dr. ALTON HOWARD THOMPSON of Topeka, Kans., read the following paper:

ETHNOGRAPHIC ODONTOGRAPHY: THE MOUND-BUILDERS AND PRE-INDIAN PEOPLES OF THE MISSISSIPPI VALLEY.

When the first white emigrants crossed the mountain barriers on the east and entered the great valley drained by the Mississippi river and its tributaries, they were astonished to find everywhere throughout this region the remains of an ancient people. There were mounds and tumuli; military earthworks in the form of circles, squares, circumvallations; effigy mounds in simulation of animals, stone graves, altars and religious symbols, temple mounds with terraces and graded ways, walls and roadways, and other structures that were imperishable, that attested the presence of a people far removed from the savage state and well on the road to civilization and culture.

Having long since passed away and left no records, they became known—for want of a better name and on account of utter ignorance of who they were and whence they came—as the “Mound-builders,” because of the marvelous and extensive earthworks they erected throughout the length and breadth of the Mississippi valley. And we know little more of them today, and still call this wonderful people the mound-builders. Who they were and whence they came is still one of the unsolved puzzles of American archæology. They were presumably of the great American race that the European discoverers found here, and they were probably more or less related to the historic Indian, some tribes of which may be descended from them. But that the marvelous structures were erected by the tribes found by the whites in this region—as is maintained by some writers—is

quite impossible; for these tribes had nothing and knew nothing of the civilization of the mound-builders. Some of the historic Indians did, it is true, erect mounds as tumuli, but they were incapable of the elaborate structures which the ancient race left, for instance in Ohio and Wisconsin, and were as ignorant of the origin and purpose of the mounds and earthworks as the white settlers who followed them. About the only thing that we are sure of is that these remains were the work of a prehistoric race of Indians whose identity we cannot make out, but who were in an advanced stage of barbarism—they were not mere savages for they were skilled in architecture, in pottery, metal work, and other branches of art and industry which were of a standard of excellence such as mere savages like the historic Indians were incapable of.

The writer is inclined to the theory advocated by J. D. Baldwin (“Ancient American,” page 70), that the mound-builders were emigrants from Mexico and were possibly the descendants of the Toltecs, that semi-mythical race whose culture the conquering and fierce Aztecs adopted as the basis of the wonderful civilization of the Mexican valley. This hypothesis explains many things in connection with the mound-builders. Baldwin says, “Their most populous settlements were in the south; this was the only coast entrance to the valley: they pushed up the Mississippi river and its tributaries: their architectural structures and their art is similar to that of Mexico and Central America: the great mounds—like the Cakokia mound near St. Louis—are like the temple teocallis of Mexico and Yucatan,” etc.

To this evidence the writer would add that of dental somatology, which is similar to that of the Mexican tribes in many features. This will be noted later.

Many writers have touched on the theory of the Mexican origin of the mound-builders, which to the writer seems the most plausible. The art, as for instance the designs on the shell carvings and pottery, are decidedly Mexican in character. Some of the figures are exact re-

productions of figures found in Mexico and Central America—and surely evidence could not be more conclusive.

But, whoever they were, they are gone—swept away by the savage tribes who were the ancestors of the Indians whom the whites found in the country. That they were much superior to the tribes who destroyed them is abundantly proved by their remains. The latter were a nomadic and hunting people, while the mound-builders were settled in towns and lived mainly by agriculture. They were probably a gentle people, like their ancestors the Toltecs of Mexico, unwarlike in their character and devoted to cultivating the soil, to architecture, to art, and to the pursuits of peace. They were vastly different from their savage conquerors in every characteristic, and that the latter could have been even the degenerate descendants of the mound-builders is quite impossible. They evidently invaded the Mississippi valley from the south; divided into different branches as they went; developed different characteristics of architecture and art in different parts of the region; erected great structures that remain to our day, lived their lives, were driven out, and died and left no record.

The groups of mound-people selected for investigation are restricted, of course, but may be taken as fairly typical and representative of the entire pre-Indian population of the Mississippi valley, varied and extensive as these were. They were probably all of one stock, and were derived from the original emigrants from Mexico. These gradually separated into groups and pushed on into various parts of the country and developed different customs and characteristics by isolation for long periods of time. If there be any general distinction to be made, it would better be in regard to age, for the deposits of some groups are undoubtedly older than others, and the older tribes were probably driven out or absorbed or exterminated by later comers. That is common with primitive people, and the overlapping waves with their consequent intermingling of stocks lead to much confusion. However, in the case of the pre-

Indian peoples of the Mississippi valley, the mound-builders and others, it is likely that the special groups selected were distinct and unmixed, and are therefore to be relied upon as sufficiently pure for our investigations.

The main groups selected as furnishing the best and most reliable material were as follows: That from the prehistoric cemetery at Madisonville, Ohio, in the American Museum of Natural History of New York, and in the Peabody Museum of Archaeology and Ethnology at Harvard University; the Fox farm stone graves of Kentucky, in the American Museum; the Lyons collection from Edmonston county, Kentucky, in the Peabody Museum; the stone grave collection of Tennessee, in the Peabody Museum; and the collection from the mounds of St. Francis river, Ark., in the Peabody Museum. These were the principal groups examined, but to the skulls from these places must be added smaller lots of skulls and single skulls from other mounds and deposits, making about five hundred in all which were tabulated. The smaller groups were from Saginaw and Detroit, Mich., miscellaneous skulls from Ohio, Kentucky, Tennessee, Missouri, and other states.*

IN GENERAL.

The broadest general characteristic with which the writer was impressed in investigating the jaws and teeth of the pre-Indian peoples of the Mississippi valley was in a large sense their essen-

* The writer desires to acknowledge his obligations to the various museums which furnished the material for this investigation, especially to the American Museum of Natural History of New York and the Peabody Museum of Harvard University, which supplied the most, and for the assistance furnished and the uniform courtesy of the officials. Also for material and uniform kindness to extend thanks also to the Academy of Natural Sciences, the Museum of Art and Archaeology of the University of Pennsylvania, and the College of Physicians and Surgeons, of Philadelphia, Pa., to the Field Museum of Chicago, the Historical Society of Tennessee at Nashville, the Missouri Historical Society at St. Louis, and others who rendered valuable assistance.

tially primitive nature. This was somewhat surprising, when considering the advance in the elements of civilization and culture that their remains indicate. The comparison was quite remarkable, and if it teach us anything it would be that their evolution in cultural attainments must have been rapid, as sufficient time had not elapsed for the degenerative effects of the vices of civilization to affect their physical organization. Perhaps, again, their civilization might not have advanced to the stage of producing degradation by its vices, but remained at a healthy and normal condition for a long period of time. Be that as it may, the fact remains that the primitive characteristics of the dental structures are not what we should expect in association with the high degree of civilization which their remains indicate. For instance, there is pronounced prognathism of the jaws as a prevalent feature. This is quite in contrast with the jaws of their Mexican ancestors, which are quite orthognathous, indicating their advance in degenerative evolution while the mound-builders remained at the primitive stage. The jaws were also strong and large and the arch prominent. The teeth generally presented many primitive features, and were yet very irregular and degenerate in different and surprising directions. One of the most impressive of these features was the great frequency of the fifth tubercle on the lower second molar. This was quite remarkable when the other molars were less well developed and some of them quite degenerate. Many other primitive features occurred in an irregular way throughout the groups. On the whole, the teeth presented many primitive features but were quite irregular as to their occurrence.

DISEASES.

As regards the prevalence of dental diseases, many indications were observed, but not to the extent that dental lesions were found among the Peruvians and Mexicans. Caries was present in all groups to some degree, but remarkably absent in some, as in the Saginaw

mounds, which are evidently very old. In the Madisonville group caries was very prevalent, with all of its usual complications, abscess, etc. In the Fox farm and Edmonston groups of Kentucky it was also very prevalent. In the stone grave people of Tennessee and the St. Francis river, Ark., groups it was more notably absent. Mechanical abrasion was variable, being extensive in some groups and less so in others, but the wear of mastication was light for so primitive a people. This might mean that they were not a maize-eating people, for we know the silica of the kernel is very destructive, as evinced by corn-eating tribes. The Peruvians had much destructive wear of the teeth, due to this food and to coca-chewing. Very little salivary calculus was observed and large deposits were notably absent. An occasional case of transverse erosion was observed, but pitting or other congenital effects of disease were absent. Taken altogether, there was not much dental disease present as compared with the Peruvians and Mexicans, as noted in previous papers.

Supernumerary teeth, deformities, cingules, etc., were quite unusual. Third incisors and bicuspid and fourth molars were rare, but were sometimes present. The fourth molar fused to the third occurred, but was rare. The peg-shaped upper third molar occurred, and sometimes the peg upper lateral, but both were rare. The suppressed upper lateral was also rare. The lingual cingule upon the upper molars or incisors was very rare. These reversions were surprisingly infrequent considering the general primitive nature of the denture of these people.

Irregularity and malposition of the teeth was very interesting on account of its frequency among these people. The deformities due to malposition were not extensive or complicated, but there was frequent occurrence of eversions, rotations, slight divergence from the line of the arch, or complete misplacement as regards the alignment and occlusion. The most common forms were such as a lower incisor standing within or without the line: the eversion of the upper centrals at the median line: rotating of

the upper laterals and lapping: the canines standing out of the line in the well-known "tusk" form: the bicuspids crowded in or out of the arch: the tipping of the third molars so as to impact them, etc. The latter was very frequent. Of these slight deformities there was a considerable amount, considering the large size of the jaws and the apparent room. There were very few, scarcely any, contracted and saddle-shaped arches. The deviations from normality of arrangement were quite similar to those of the Mexicans as to types, as we should expect, except that they were mostly quite simple and not as extensive as the latter.

SKULL FORMS.

The cephalic contours and indices of the pre-Indian tribes were most interesting, as they presented types that were quite constant within groups. In general the forms were decidedly brachycephalic and high, and long skulls were very infrequent. There was considerable occipito-frontal flattening, the usual cradle-board effect. This was especially common in the Kentucky stone-graves but was found elsewhere to some extent. The long skulls were not sufficiently frequent to constitute a class, and were evidently intruders. Many of the round skulls were prognathous, with all of the long skulls, of course. Indeed, prognathism was found generally among these people as a primitive feature. The parietals were usually bulging, but the valley between the parietals was not marked.

The skulls from the Saginaw group of mounds were very old and friable. They were very large, and were round and high with retreating forehead. In characteristics and condition they gave every evidence of being very ancient, and there is every probability that they belong to a period anterior to that of the Mexican emigrants who built the mounds and tumuli.

In the Madisonville cemetery they were generally quite round and high, and usually small. They ranged in size below medium. The few large skulls usually had the full bulging occiput and the high

sagittal ridge. There was very little flattening observed in this group, and as this was slight it may have been due to earth pressure. The very bulging parietals were probably normal though the flattened skulls had more of this prominence than the others.

The miscellaneous skulls from the mounds of Ohio were of the same character, *i.e.* round, high, full parietals and some few flattened.

The skulls from the Fox farm group in Kentucky were, as a rule, round and high with full parietals. There was a large proportion of occipito-frontal flattening with consequent bulging of the parietals. The majority seem to have been flattened as if the custom was very common in this group.

The skulls from the Edmonston county, Ky., group were, as a rule, small, and were round and high. The large ones were round but with the bulging occiput. There was some flattening, but not so much as in the previous group.

Those from the stone graves of Tennessee were large, round and high, and strong and very coarse as compared with the small, light skulls of the previous groups. The majority were very large and very few small ones were observed. There was much flattening with corresponding bulging of the parietals. The median ridge was usually quite prominent. A very few were long with bulging occiput, and some of the round skulls presented this feature also. The prevalent form was decidedly brachycephalic, which would indicate a pure blood stock in this group.

The small Natchez group were much flattened.

The large group of the St. Francis river mounds in Arkansas were very interesting. The skulls were medium in size, all round and high with markedly high, full parietals, even in the normal specimens. The sagittal ridge was markedly full in most of the specimens. There seemed to be little or no flattening, except from earth pressure. This would show a distinct culture as to customs from the stone grave people of Kentucky and Tennessee.

The Missouri mounds showed the usual form of large, round high skulls, with high sagittal ridge and some flattening.

The miscellaneous mound-builders' skulls from various parts of the Mississippi valley showed the same general type, but with a proportion of long skulls that were probably intrusive burials. These narrow specimens usually had the bulging occiput. There was some flattening, but not much, in these miscellaneous skulls.

The jaws, dental arch, and vault were especially interesting among these people, on account of the primitive features which they exhibited, which are quite remarkable for people so far advanced in the elements of culture and the arts. The most impressive of these primitive features was the prognathism that was almost constant, as it prevailed largely in almost every group, and, as it was associated with the prevailing brachycephalism, was very remarkable. The prognathism is quite at variance with their relatives in Mexico, who are quite decidedly orthognathous, with round arches and round heads. But in the pre-Indian peoples of the Mississippi valley we have the anomaly of prognathism with round heads. The contour of the arch was usually square, as an accompaniment of prognathism, but thin and inharmonious with the round head. The vault was usually quite deep also. Indeed, all of the general features were primitive to a surprising degree.

In the Saginaw group the jaws were very prognathous and the vault deep. The arch was usually square or round square. The width of the upper arch—measuring at the outside of the first molars—was 6 cm. to 5.5 cm., which is rather narrow for such large arches but not for the square type. This group being more ancient, of course the features are very primitive.

The Detroit group ranged in width from 6 cm. to 5.5 cm., the arch square and flaring at the back and the vault deep, and prognathous of course.

The Madisonville group presented a larger percentage of the round arches which were more in harmony with the

round craniums. There was considerable prognathism, especially with the square arches, but less than in some other groups. A few round V-shaped arches were noted, but were probably abnormal. The vault was unusually deep and square, very few shallow roofs being noted. In measurement—from the outside of the upper first molars—the width of the arch ranged from 6 cm. to 5.5 cm., a very few being below 6 cm. and some up to 7 cm., but not many; the average was 6.3 cm., which is quite large. The Mexicans ranged from 6 cm. to 5.5 cm., so the average of these jaws is high.

The miscellaneous skulls from the Ohio mounds presented much the same characteristics as regards the jaws and arch, except that there is more uniformity. There was a general average of 6 cm. to 6.5 cm. in width.

The Fox farm, Ky., mounds presented a majority of the large round arches with converging at the rear, and an occasional round V arch; a very few were abnormal and contracted. The average width was 6 cm., ranging to 6.5 cm. Some were down to 5.5 cm., and a few were very large, running up to 7 cm. and even over; the latter are remarkably large. While there was great variety, the shapes were nearly all round with very few square arches. Prognathism was very prevalent, the majority even of the round jaws being very prognathous. Some of the very round arches were orthognathous. The vaults were usually very deep, but a few flat roofs were noted in the small arches. The constancy of type was quite interesting.

The Edmonston county, Ky., stone graves presented a large proportion of round arches with a good number of round V's. Very few square arches were noted, the prevailing type being round with converging ends. In width the average was near 6 cm., although a large number were below that, running to 5.5 cm., and even down to 5 cm., which is quite small. The vaults averaged deep, and prognathism was constant even with the small round arches with delicate craniums.

The Tennessee stone grave skulls were

characterized by very large round arches with both flaring and converging ends. There were some round V's. The alveolus was thick and the general features were very primitive. The vault was deep and square in most cases. The average width was 6 cm., with a very few below or above. This constancy would again indicate, as in the case of the skulls, that these people were comparatively pure in stock, with of course some later intrusions. Prognathism was of course prevalent in all forms of arch, but especially in the few square arches and the round V's. The features are all quite primitive and remarkably uniform in this group.

The St. Francis river, Ark., group were interesting on account of their uniformity, there being a prevalence of the large round flaring arch. There were a few square and some round V arches. The average width was 6 cm., with very few above or below. The vault was usually medium deep and prognathism was prevalent, but not so pronounced as in the previous group.

The Missouri mounds averaged larger and stronger, being round and round V, with an average width of 6.5 cm., which is quite high. Prognathism prevailed and the general structure was coarse and primitive.

The miscellaneous specimens from various other states did not present great variety beyond the average of the distinct groups catalogued. There was the same round arch or round V, the average width of 6 cm. or 6.5 cm., and the deep vault and prognathism. The features were generally primitive and uniform with those of the large groups.

The upper central incisor, as with most of the other teeth, presented features that were both primitive and advanced. The principal varieties were the wide crown and wide neck and the wide lower crown and narrow neck. These types were well marked, and the primitive wide neck prevailed in some groups. The wide lower half of crown and narrow neck is more advanced and is that which is most prevalent in the more developed tribes of Mexico.

In the Saginaw group the central was

of medium size but much worn, as these skulls were very ancient, and the features were primitive.

In the Madisonville group the prevailing type was that the centrals were large, long, and square to the edge, with flat face, narrow neck, and with a deep lingual fossa and high ridges. The narrow neck with wide lower crown is not primitive. The face was usually flat with no indication of the primitive labial ridges, so the type in this group was advanced.

The miscellaneous Ohio mounds exhibited much the same features—the wide lower crown, narrow neck, and flat face. There was usually a well-marked lingual fossa with high ridges, which is a primitive feature.

In the Fox farm, Ky., group the central was usually large, with wide face to neck, wide neck, and round to edge. Some specimens measured 1 cm. to 1.3 cm. in width, which is very remarkable. The face was flat and long and square in outline. These are very primitive and ape-like and well marked. A very few had the more advanced type of wide lower half and narrow neck, but the majority had the wide, primitive neck, which was quite uniform and constant in the group. Labial ridges were also present in some of the more primitive specimens. This is an early and ape-like feature.

The Edmonston county, Ky., group of stone graves presented some of the lower wide face tapering to a narrow neck. A few were of the wide crown and wide neck type, but not many. The other features were not so primitive as in the previous group.

The Tennessee stone grave group, as was to be expected, had more of the primitive type of the wide crown and wide neck. Some of the crowns were 1 cm. in width, and one or two even over that. The deep fossa and high lingual ridges were also well marked. All the features were primitive and uniform in this relatively pure group.

In the Natchez group the type was narrow neck and wide lower half of the crown—not so primitive as we would expect.

In the St. Francis river, Ark., group

the type of the upper central was wide lower half, tapering rapidly to narrow neck, although some had wide neck with slight labial ridges. The lingual fossa and ridges were not so conspicuous as in some other groups.

In the Missouri mounds the prevailing type was wide lower half and narrow neck.

The miscellaneous mounds of other states generally presented much the same types and were not so primitive as some of the distinct groups.

The upper lateral incisors were similar to the centrals with which they were associated, but seemed to have in a general way more tendency to quite wide edges and very narrow necks with deep lingual fossa and high ridges. There were a very few deficient, peg-shaped crowns, and but one or two cases of total suppression, in the hundreds examined. There was not much tendency to wide necks even when the centrals were of this type.

In the Madisonville group the laterals were generally large with wide necks like the centrals; many, however, were wide at the edges and narrow necks. The labial face was generally more rounded than the centrals, and the rounding of the distal corner was usually very marked. Cingules on the lingual basal ridges were not numerous. A very few degenerate, peg-shaped crowns were observed, and even slightly deficient crowns were rare. Very rarely was the defect of the groove passing over the basal ridge on the neck on to the lingual face observed.

The Fox farm, Ky., group presented the type of wide edges but narrow necks, deep lingual fossa and high ridges, which was quite prevalent; there was little variation from it.

The Edmonston county, Ky., group had the type of lateral having quite wide edge with narrow neck, flat face, etc. A very few were deficient to the extreme of peg-shape.

The Tennessee stone graves exhibited some with wide edges and narrow necks and round face, and many others had thick necks like the centrals in this group. The lingual fossa and high ridges were well marked.

The St. Francis river, Ark., group presented the type of flat face, wide edge, and narrow neck, but a number were wide-necked also. But few were peg-shaped or deficient.

The resemblance to these of the Mexicans is apparent, but some of the special features are absent. On the whole the laterals exhibited great simplicity and uniformity as to general outlines and characteristics.

The lower incisors were of the usual simple form with little deviation except as to the comparative width of the central and lateral. In the most primitive types they are of the same width with no distinguishable difference except as to the roundness of the distal corner of the lateral incisor. In the more advanced races the central is narrower than the lateral, and the latter flares at the distal side. In the lower races the central flares as much as the lateral. As a rule, in all the large groups of the pre-Indian peoples—the Madisonville, Fox farm and Edmonston, Ky., the Tennessee stone graves, and the St. Francis river—the centrals were strong and long with quite wide edges, often quite like the laterals in the coarser tribes. In the more refined skulls the central was quite narrow. The perfection of form was constant.

The upper canines presented some marked characteristics, some of which are quite primitive. The primitive, spear-like form of the labial face was quite prevalent in some groups, but there was some deviation to the conical type also. These teeth were not very large in general, but this was probably due to the association and correlation with the round arches, which does not have as large and conspicuous canines as the square arches. Some few had well-marked ridges on the lingual face, but not many. The labial face was usually flat in the spear shape, but in the round variety the vertical eminence was quite conspicuous.

In the Madisonville group the spear shape was quite prevalent, with flaring mesial and distal margins and round face which is most usual. The conical form

was rare. They were usually large with deep roots.

The miscellaneous Ohio mounds presented the same general spear shape with flat face.

In the Fox farm, Ky., group the canines were quite large and long, and the type was rather more conical with roundness and fulness of the labial face. There was an occasional flaring of the distal borders; but few were of the strongly marked spear shape of the previous group. The fulness of the labial face was quite a marked feature.

The Edmonston county, Ky., group had canines that were generally medium large, with full labial face, with some few that were more flaring with flat face and spear-shaped outlines.

The Tennessee stone graves gave the type of medium to large in size—of round form but with flaring distal borders. The most were quite conical, and small. The type of canine was not so primitive as the other features would seem to indicate, as they were not very large nor coarse. There was more abrasion in this group than in some others, so the general features were somewhat obliterated, but the crowns were long with thick necks.

In the St. Francis river, Ark., group, they were medium to large, and were more generally of the spear shape with flat face. There were many of the round type with full labial face also, but the conical type was not prominent. The apparent reduction of the canine in all of these people was in probable harmony with the round arch in which this tooth is always reduced.

The Missouri mounds presented the type mainly of the large spear shape with flaring sides and flat face, with a few conical round forms also.

The miscellaneous mounds in other states furnished great variety, both the conical and spear shape being found without any uniformity as to type. Among the Mexicans the same general types were found, the prevalent smallness of the canines being in harmony with the prevalent round arch also.

The lower canines among the mound-

builders and pre-Indian tribes of the Mississippi valley were also of two general shapes, *i.e.* the flaring leaf shape, in which the crown had a vertical median face but flared greatly at the distal border, with flat full labial face, and the long, conical shape with full labial face and sharp point. These two types were mixed in all of the groups, so that there was little uniformity, one being more prevalent than the other in some groups. In size they were small to medium, of course, like the uppers. The lingual ridges were not marked, as this is a primitive feature and these teeth were reduced.

In the Saginaw and Detroit groups they were rather small and usually flaring at the distal. The conical form was not conspicuous in these peoples.

In the Madisonville group the lower canines were small to medium and the conical form predominated, with comparatively few that flared distally. In the Turner group in the same locality they were quite large with full labial face.

In the miscellaneous Ohio mounds the conical form predominated, the crown being long and pointed.

In the Fox farm, Ky., group, these teeth were quite large, coarse, and conical. There were very few that flared to the rear.

In the Edmonston county, Ky., group they were more flaring and wide at the distal side than the previous group. There were but few that were fully conical.

In the Tennessee stone grave people these teeth were large, and as a rule quite wide and flaring, with quite a full labial eminence. There were few of the conical type. They were rather small as compared with the primitive features of this group.

In the Natchez mounds they were large and conical.

The St. Francis river, Ark., group were medium to large, and averaged conical in shape, which was the prevalent type, although there were some few with flaring distal border and straight labial face.

In the Missouri mounds they ranged

large and conical, but with full buccal face. In the miscellaneous mounds the conical form also predominated to a degree.

The *bicuspid*s presented some interesting general features and showed some relationship with the Mexican types, although the prevalent smallness of the latter was not observed to the same extent among these peoples. Some general resemblances were found, but they were not constant. Perhaps this was to be expected, for the Mexican type was probably evolved after the departure of the emigrants to the Mississippi valley, and then followed the increase of the physical degeneracy which took place in Mexico.

Be that as it may, the type of the *bicuspid*s is very variable in the Mississippi valley, and ethnic features are difficult to make out.

The *upper bicuspid*s were large, and were flat and primitive, in harmony with the general features of this ancient group.

In the Detroit group they were medium, oval, and flat.

In the Madisonville group they were medium to large, quite short and flaring at the marginal ridges, and of the distinct pear shape that prevailed in Mexico, *i.e.* wide at the transverse mesio-distal diameter of the buccal side and very narrow at lingual side. This pear shape is quite conspicuous, although there were many of the flat and oval forms as well. The types were, in fact, very greatly mixed.

The Fox farm, Ky., group ranged from medium to small, some being very large and some very small. The types were confused also—oval, flat, and pear shape being generally found. Perhaps the large oval type predominated slightly.

In the Edmonston county, Ky., group the *bicuspid*s were quite small and the pear shape was in the majority, the type being quite Mexican and would seem to indicate relationship.

In the Tennessee stone graves, the *upper bicuspid*s were medium to large and of the Mexican pear shape, *i.e.* wide buccal and narrow lingual sides; often they were quite triangular, some of these being

very small. The extreme specimens of this Mexican type were not common, however. Some had three roots, which is a simian reversion.

The St. Francis river, Ark., group were of the mixed types, but the small pear shape predominated, and it was quite like the prevalent Mexican form in its main features.

The Missouri mounds and the miscellaneous mounds were of the same general forms, with the pear shape predominating.

The *second upper bicuspid*s were of the same general types as the first, except that they were as a rule smaller, some very small, and the main features were not so well marked. There was a larger proportion of the oval and flat forms, and not so many of the triangular and well-defined pear shapes as with the first. Taken altogether, the pear shape was well marked, however. Being smaller they recalled the Mexican type more than the first, but there were no peg-shaped crowns or real deformities on account of degeneracy, as with the Mexicans.

The *lower bicuspid*s were in general smaller than the uppers, and the patterns of the occlusal faces were quite primitive. Like the Mexicans, they were quite degenerate as compared with the uppers, and had more of the relative smallness of crown.

The *first lower bicuspid*s in the Saginaw group were small, with the lingual cusp in the second position, as a rule.

In the Madisonville group they were small and the lingual cusp was low, between the second and third positions, the buccal face being full, as usual. The position of the lingual cusp was affected more by deficiency and degeneracy of form than by evolutionary degeneracy, as with the Mexicans. The third position of the lingual cusp was not uncommon.

The miscellaneous Ohio mounds were much the same, except for the frequency of the fourth position of the lingual cusp, which is very primitive—an insectivorous feature, in fact.

In the Fox farm, Ky., group they were small with a large proportion of the third position of the lingual cusp, the

second coming next in frequency, and then the fourth. The frequency of the lower positions was quite remarkable, and impressive as indicating primitive reversion.

The Edmonston county, Ky., group were quite small with the lingual cusp ranging from second to third positions, and occasionally fourth. A rare occurrence was the disto-lingual projection on the lingual marginal ridge. This unique feature occurs frequently with the Peruvians (it is distinctly an insectivorous reversion), and also to some extent with the Mexicans.

The Tennessee stone graves gave a majority of the third position of the lingual cusp, the second next, and then the fourth; this is quite primitive. The crowns were small with the full buccal face, in which they differed from the Mexicans, in whom the face of the deficient crowns was usually perpendicular.

The St. Francis river, Ark., group gave these teeth in size medium to small, with the majority of the lingual cusps ranging from the third to the fourth position, with the second next. The prevalence of the low positions was very marked, indicating the predominance of the primitive types. The teeth in this group were lower in the evolutionary scale than those of the Mexicans.

In the Missouri and the miscellaneous mounds there was great variety of the position of the lingual cusp, but the majority were quite primitive, ranging from second to fourth. The size was usually small, below the average.

*The lower second bicuspid*s are very interesting also on account of the evolutionary significance of the occlusal features. As is well known, in the higher races, as the Europeans, the tricuspid pattern of this surface is well marked, but in lower races this tooth has either a transverse ridge like the first bicuspid or has an undivided crescent cusp on the lingual marginal ridge. Therefore the three cusps become the reliable sign of the elevation of a race, *i.e.* they have more of the three-cusped type, and low races have more of the crescent and cross-ridge types. This rule is reliable and is

of value in the study of the ethnology of the teeth. It was with great interest that we observed, therefore, that the low types predominated in the pre-Indian peoples, and that the three-cusped pattern was in the minority.

In the Saginaw and Detroit groups, for instance, the crescent and cross-ridge type prevailed, as we should have expected in these primitive peoples.

In the Madisonville group these teeth were very small, with the crescent and cross ridge (in about equal proportion) in the great majority. The buccal face was full. Very few tricuspid crowns were observed, and a few full bicuspid. The crowns were short and flaring, *i.e.* wide at the marginal ridge and narrow at the neck.

The miscellaneous Ohio mounds were medium in size and with prevalence of the crescent form of the cusps.

The Fox farm, Ky., group presented the type that was small to medium, with predominance of the crescent and cross ridge in equal proportion. Tricuspid and partial tricuspid forms occurred a little more frequently than in the previous group.

A very few were of the type of the first bicuspid with depressed lingual cusp. This reversion is very rare and is distinctly insectivorous.

In the Edmonston county, Ky., group these teeth were small with cross ridge and crescent (in about equal proportion) predominating. A very few were tricuspid and still fewer were bicuspid like the upper bicuspid.

In the Tennessee stone grave people there was the same predominance of the cross ridge and crescent forms, with a very few tricuspid or partial tricuspid. The size was small to medium and the features were generally quite primitive in this group.

In the St. Francis river, Ky., group these teeth were quite small generally, with the same proportion of crescent and cross ridge types, with a few tricuspid and partial tricuspid types.

The Missouri and the miscellaneous mounds were about the same.

This uniformity of the proportion of

the various patterns of the occlusal face of the lower second bicuspid, is something remarkable, and speaks volumes in favor of the low stage of these people. They were better developed than with the Mexicans who had these teeth very small and deficient, not full on the buccal face and almost cylindrical. With these people, however, the crowns were usually full and the buccal bulge prominent, but there was a less proportion of the tricuspid type than with the Mexicans, and more of the lower forms of the occlusal face.

The molar series of these people presented characteristics that were most interesting, yet also very perplexing and confusing. There were many primitive features presented, and yet with variations that were most remarkable and unaccountable. These we will not now attempt to explain, but only try to record them as observed. We must await further investigations to throw light on the remarkable variations found in the molars of these people.

The upper first molar in the Saginaw group was surprisingly small for such an ancient and primitive people. The form was not usually square, but rather trapezoid, owing to the depression of the metacone (the disto-buccal cusp). In the Detroit group the form was much the same.

In the Madisonville group these teeth were medium in size and exhibited great variability of the metacone. Some were trapezoidal with reduction of the metacone and the hypocone (the disto-lingual cusp), or again by the reduction of the protocone (the mesio-lingual cusp) and the paracone (the mesio-buccal cusp). Other forms were the diamond shape from the reduction of one pair of cusps and the enlargement of the others. Sometimes the hypocone was suppressed entirely, making a three-cusped molar, although this form was more frequent with the second molar. The large full, square type was quite in the minority. The smallness and variability of the upper first molars is most remarkable, for this tooth is usually quite constant and stable as to its form. The lingual groove was

present in quite a number of the square and trapezoidal forms. This is a very primitive feature and leads back to the apes.

The miscellaneous mounds of Ohio presented a number that were large and square and well formed with the lingual groove, but a large proportion were trapezoidal.

In the Fox farm, Ky., group there was much variability of form and size, the most being medium to small. Perhaps the most prevalent was that of the trapezoidal, where the metacone and the hypocone (the disto-lingual cusp) were reduced. The slight reduction of the metacone was observed in all, even of the square crowns, of which there were a number, so that it begins to be possible that the reduction of the metacone may be a more or less constant feature of the upper first molar as the reduction of the hypocone is of the second. Some first molars that were not quite erupted in young skulls were square and quite wrinkled. A distinct diamond form was not unusual. The variability of the first molars in this group was quite remarkable.

In the Edmonston county, Ky., group they were large and of square and trapezoidal form, the metacone and hypocone being reduced in the usual trapezoidal type. The lingual groove was common. There was not as much variety here as in the previous group, as the types were more constant.

In the Tennessee stone graves they were medium to small in size, ranging from square to trapezoidal in form, with the lingual groove. The partial diamond form often occurred. A very few tricuspid forms occurred in which the hypocone was suppressed and the type of the second molar was produced. This is not common in the first molar. It reminded one of Professor Cope's theory of the lemurine reversion of the upper molars in man, as especially exemplified in the Latin races. The infrequency of the full type of the first molars is quite extraordinary, for they were very irregular as to form in all of these people.

In the St. Francis river, Ark., group

they were large, with the same trapezoidal type predominating. Some of the full square form occurred with the lingual groove, also with the wrinkled face, and again the diamond shape, but the latter irregularity was less frequent than in the previous groups. The low metacone was the one conspicuous feature that seemed constant.

In the Missouri mounds and the miscellaneous mounds of other states they ranged from large to medium and were square, trapezoid, and diamond shape in forms, but the full square type was uncommon, as with the rest.

In a general way the variability of the upper first molar among these people was most remarkable. The full square type was most rare, and yet this is a fairly constant and stable form. The meaning of these deviations is too difficult to read, so we must await the collection of further data before attempting to unravel the puzzle of their affinities and relationships, for among the Mexicans this tooth preserved its integrity of form very well, although most of the other molars were very variable. The collateral degeneracy of the entire molar series is not so noticeable as with the Mexicans—being in fact so very erratic. The metacone was reduced to a degree in some of the Mexican tribes, but not the other elements so much as with these pre-Indian peoples. Perhaps a chain of affinities might be followed out by more extensive investigations and tabulations. The field is most alluring and promising to the odontologist seeking fields that are new and unworked, and the results will undoubtedly throw light on obscure problems of American ethnology.

The upper second molar presents more uniformity than the first in being more reduced as a constant thing by the depression or absence of the hypocone. The partial or entire suppression of this element produces the usual trapezoidal or tricuspid form of this tooth, which is quite constant in all races except the very lowest and ape-like, so that the full square form is quite rare in higher races that have any evolutionary advancement whatever. This is so constant as to have

a diagnostic value in the placing of a race in the scale of evolution. So in these people this tooth was reduced as usual in the elevated races, and presented the ordinary form of the suppressed hypocone.

In the Saginaw and Detroit groups, this tooth was of large size and usually with trapezoidal form.

In the Madisonville group they were medium to small, trapezoidal and tricuspid in form, in irregular combinations. The hypocone was usually reduced or absent, the metacone not being so much depressed in this tooth. There was a large predominance of the tricuspid form in which the hypocone is suppressed entirely and the protocone enlarged to extend over the entire lingual face of the tooth, as is common in Europeans. The trapezoidal form was next in frequency, in which the hypocone is but partially suppressed and the metacone is depressed also. The trapezoidal form is often quite large and is accompanied by the lingual groove. Often the tooth on one side is trapezoidal and on the other is tricuspid, showing the erratic nature of these variations. Rarely there was a diamond form in this group also.

The full square form did not seem to occur in this group, so the evolutionary degeneracy was quite marked.

The miscellaneous Ohio mound showed type medium to small and trapezoidal and tricuspid, the latter predominating.

In the Fox farm, Ky., group it was large to medium, and the form was medium and trapezoidal to tricuspid, the latter predominating. A very few were full square with hypocone and metacone in good form and with the lingual groove like the first. This perfection of form is very unusual.

In the Edmonston county, Ky., group the type was medium to small, trapezoid and tricuspid, the latter predominating. More diamond-shaped crowns occurred in this group than in the previous one, but the prevailing type was small tricuspid.

In the Tennessee stone graves the types ranged from medium to small and quite small, with the tricuspid form predomi-

nating and the trapezoid next. The tricuspid form was largely in the majority, which is interesting considering the very primitive types of some other features in this group. There were a few diamond-shaped, but no full square forms were observed.

In the St. Francis river, Ark., group the type was medium to small, trapezoid and tricuspid, the latter much predominating as usual, the regularity of which is quite remarkable in these peoples.

In the Missouri mounds they were quite large, tricuspid and trapezoid. A few were square and some few were diamond shape.

In the miscellaneous mounds the types were indefinite, ranging from full square to small trapezoid, the latter predominating.

The prevalence of the tricuspid type of the second upper molar among this people, who had so many other primitive features, is very remarkable.

It shows an irregular degeneracy, such as might have occurred before the beginning of a progressive degradation of physical structure which was harmonious all along the line. In the Mexicans this tooth presented more variety and the full type square form was not so unusual.

The lower first molar being the most constant in form and persistent in type of any teeth in the human denture, of course presented among these peoples the largest proportion of full typical forms. Very rarely was there loss of the fifth tubercle, like the second molar, or a division of a cusp to make a six-cusped tooth (which is not a type), or the mesial root was divided into two roots, but such variations were rare and did not affect the main type of the teeth.

In the Saginaw and Detroit groups this tooth was very large and flaring, with wide occlusal fossa and rearward elongation—which is a simian feature.

In the Madisonville group these teeth were large and flaring, with the simian elongation well marked. In some the fifth tubercle seemed to be reduced, but it was never absent. The occlusal fossa was usually wide, the triangular ridges not being well marked; this is also a sim-

ian feature. Rarely the cusps were high and sharp in the young skulls.

In the miscellaneous Ohio mounds the large and square form prevailed with wide fossa. Occasionally some were wrinkled, especially in young subjects. The reappearance of this orang feature so frequently in the molars of this people is quite interesting and remarkable.

In the Fox farm, Ky., group they were usually large and flaring, with wide fossa. The backward elongation was prevalent. Some were wrinkled. A very small number had the fifth tubercle divided, making a six-cusped tooth, and the divided mesial root was observed, but these irregularities are not types.

In the Edmonston group these molars were usually very large and flaring, with wide fossa and backward prolongation. The regular features were quite constant.

In the Tennessee stone graves these teeth were unusually large, with the wide fossa and simian projection quite conspicuous. The full primitive features were all well marked and constant.

In the St. Francis river, Ark., group they were large to medium, with wide fossa and projecting at the rear. Some few among the young skulls were wrinkled. The general forms were very constant as to the type.

In the Missouri and the miscellaneous mounds they were large and flaring, and the usual constancy prevailed.

The lower second molar is usually quadritubercular in the higher races, so it was to be expected that this type would be prevalent among these people. In the lower races the fifth tubercle is found more frequently on account of their nearness to the apes. But one of the great surprises among these pre-Indian peoples who presented so much variety and evolutionary degeneracy of the dental features was the large proportion of fifth tubercles on the *second* lower molars. We should rather have expected the predominance of the quadritubercular form.

In the Saginaw group, on account of these people being of ancient type, the fifth tubercle was in the great majority; very few of the four tubercles were found.

The crowns of the second molars were

large and flaring and just like the first—owing to the fifth tubercle, of course, and the consequent enlargement of the crown. In the Detroit group the same proportion was also found.

In the Madisonville group the fifth tubercle was also very prominent—was indeed in the largest proportion, not one in four having the quadritubercular form. The crown was wide and flaring like the first, with the same wide fossa. This is a remarkable development of five tubercles in view of the variety and degradation of the other molars, some of which are usually so stable.

In the miscellaneous Ohio mounds the fifth tubercle was in about the same proportion. The crowns were of the same flaring form.

In the Fox farm, Ky., group this tooth was large and flaring, also with a preponderance of the fifth tubercle with wide fossa, the fourth being in the minority.

In the Edmonston, Ky., group there was the same proportion of the fifth tubercle and the large and flaring crowns like the first.

In the Tennessee stone graves they were of the same large flaring crown with the large proportion of the fifth tubercle with wide fossa. This was to be expected in this primitive group. There were very few of the cinquetubercular form, not a fourth.

In the St. Francis river, Ark., group there was a preponderance of the fifth tubercle with the flaring crown and wide fossa. But there were more of the quadritubercular form than in the previous group, and the primitive features were not so well marked.

In the Missouri mounds and those from the miscellaneous mounds from the other states the same proportion was observed, so that the general prevalence of the majority of the lower second molars having the fifth tubercle was quite impressive. This was not to be expected with peoples having so many of the stigmata of degeneracy in the other molars. It was most remarkable, and especially so as among the Mexicans the quadritubercular form predominates. There

were comparatively few of the full five-cusped type observed among them, and why their relatives of the Mississippi valley should present the more primitive form is one of the interesting problems of this study.

The third molars presented great variety of forms of degeneracy, as might have been expected with a people whose general dental degradation and variation was so marked.

The upper third molars exhibited quite as much variety of form and degradation as in any races except the very lowest. As the teeth of these peoples were very irregular in type, the third molars were naturally quite erratic as to form, position, impaction, suppression, etc.

In the Saginaw and Detroit groups they were medium in size and were trapezoid, tricuspid, and bicuspid in form, but with few suppressions.

In the Madisonville cemetery they were medium and of tricuspid and bicuspid forms, some of them being very small. The extensive reduction of size was quite impressive in this group.

In the Turner mounds they were generally large and tricuspid.

In the miscellaneous Ohio mounds they were medium to small and mainly tricuspid to trapezoid.

In the Fox farm, Ky., group, they were medium to small and of tricuspid and trapezoid forms. There were several cases of suppression. One or two had the enlargement caused by the attachment of the fourth molar.

In the Edmonston, Ky., group they were small to medium and of trapezoid, tricuspid, and bicuspid form with some suppressions.

In the Tennessee stone graves they were small to medium and of trapezoid, tricuspid, and bicuspid forms. Some were wrinkled, as in other groups, a few were large trapezoid and a very few were full type like the first molar.

In the Natchez group they were trapezoid and tricuspid.

The St. Francis, Ark., group were medium to small, trapezoid, tricuspid, and bicuspid in form. No full square crowns were noted.

In the Missouri mounds they were large and trapezoid and tricuspid, and in the miscellaneous mounds were of much the same type.

The lower third molars presented the same general irregularity of form, but not to the same extent as the uppers. This greater constancy of type is common to all of the higher races in this tooth. The common forms were the fifth and fourth tubercles, and some enlarged as if by the addition of the fourth molar. Impaction was far from infrequent, the usual form being that of tipping against the second molar. There were some suppressions, but not a large proportion.

In the Saginaw and Detroit groups this tooth was large and flaring, with the full typical five tubercles, or four or wrinkled.

In the Madisonville group, there were the five and four tubercles and irregular and wrinkled forms. Some were enlarged by the addition of the fourth molar. The prevalence of this enlarged type was quite conspicuous.

In the miscellaneous Ohio mounds the types were much the same, but very uncertain—the fifth, fourth, irregular and wrinkled; some few were irregular three-cusped.

In the Fox farm, Ky., group they were irregular—four and five irregular and wrinkled, large and small, and some enlarged like the addition of the fourth; very few were of full type like the first.

In the Edmonston, Ky., group they were large and irregular, four and five cusps and wrinkled, etc.; a few had the fourth molar added.

In the Tennessee stone graves they were large and irregular—four and five tubercles, wrinkled, fourth molar added, etc. Some few were of the full square type like the first. There were quite a number of impactions in this group.

In the St. Francis river, Ark., group they were of much the same type—four and five tubercles and irregular, wrinkled, etc. There were many cases of suppression here, more than in the last.

In the Missouri and miscellaneous mounds the proportion of the types was about the same.

As to generalizations and deductions,

there is not much to be said. The groups covered were not sufficient to form generalizations for the whole Mississippi valley, and yet were complete in themselves. It is highly probable that distinct types of physical organization were developed after the dispersion subsequent to the invasion from Mexico, and that sufficient time had elapsed to effect a positive differentiation in somatological characteristics from the time of the dispersion to that of the destruction of the civilization by the incoming from the north of the Indians known to history. This differentiation is well shown in the variability of the teeth, especially of the molar elements. These variations in form and types of degeneracy are very remarkable and we cannot as yet read their meaning, but they serve to sharpen the appetite to know more of kindred peoples in order that we may trace their affinities and relationships; for it is becoming apparent that just as truly as the history of the evolution of the molars throws light upon the phylogenetic history of the mammalia, just so surely does the study of the human molars throw light upon the history of the evolution of the human race and upon the ethnological relationship of races. We can and will make a great contribution to the solving of many knotty ethnological problems by the more extensive investigation of ethnographic odontology; and for that great purpose, as well as for other important considerations in regard to adding to our knowledge of the dental organs themselves for its own value, I would again urge the pursuit of the subject in fields that may be accessible to students in all parts of the world.

The PRESIDENT. You have listened to a most instructive and interesting essay, and we can but compliment the author on the valuable information contained in his communication. Dr. Thompson has for years devoted himself in a most unselfish manner to unearth data of untold interest to the student of anthropology, and we feel indebted to him for presenting to this section the result of this part of his investigations.

(To be continued.)

MASSACHUSETTS DENTAL SOCIETY.

Fortieth Annual Meeting.

(Continued from page 951.)

At the evening session a paper was also read by Dr. HORACE L. HOWE, Boston, on "Orthodontia." (Printed in full in the present issue of the COSMOS, at page 1002.)

Discussion.

Dr. A. P. ROGERS, Fall River. I want to first congratulate Dr. Howe on his results. I think they are among the most satisfactory that we will see. I wish also to ask for a little explanation of the retention in cases of this kind. We have all seen from his illustrations of the cases that it is perfectly possible to obtain these results, but the question is, how to retain them. Many of us might undertake these cases, and in the course of a few years have them go back, unless we understand properly the methods of retaining them.

The double-wire device is something entirely new to me. In my readings on the subject of orthodontia I have never seen this, and I think it is very valuable, because the tipping of the anterior teeth is frequently to be avoided. In case IV, where the essayist resorted to extraction, I want to ask if the center or frenum of the mouth was not shifted after the bicuspid was extracted. We have nearly all seen cases of this kind, and the result is that it gives to the patient an unnatural expression.

I would like to say a few words with regard to the intermaxillary elastics—original with Dr. H. A. Baker of Boston. The use of these elastics appears very simple when we read of them in a paper or magazine. It would appear as though we could apply them with impunity and expect beneficial results, but that is not the case. There is no question that Dr. Howe has succeeded admirably in their use; but when we em-

ploy them we must take into consideration the facial lines of the patient, because ruinous effects may be the result of their improper use. It is absolutely essential that we should study the facial lines, as no man should undertake the work of orthodontia unless he be familiar with the typical lines of the face. For instance, if the upper arch appear protruded, we will very often apply the Baker anchorage or intermaxillary anchorage with a view to bringing out the lower arch, and unless we are careful in applying the anchorage we shall not only bring out the lower, but we shall retract the upper, thereby causing a greater angle at the junction of the upper lip and the nose, which in some cases destroys a beautiful face. This is something that cannot be emphasized too strongly. The facial lines in orthodontia practice are of the greatest importance. We must also remember that when the appliance is reversed we are likely to have similar results with the lower arch. It is therefore necessary for all those undertaking orthodontia operations to give great attention to the study of facial art. Have photographs taken before the treatment, and study these carefully. In many cases we find the upper lip in perfect harmony, and it is in this class that it is well to be careful in the application of the Baker anchorage. Now, in order to avoid the harmful effects in what we call mesial movement of the lower arch, we must be sure to have the point of anchorage stationary, and then proceed to move the anterior teeth, and then the posterior, but we must not attempt to move the whole arch, for in this way we are liable to destroy the facial lines.

Dr. H. L. HOWE, Boston. I agree with Dr. Rogers that retention is one of

the most difficult parts of orthodontia. In cases of distal occlusion, however, I may say that when the lower arch is brought forward, and the upper teeth retracted by the use of the elastics, these teeth generally occlude, and so interlock that they will be retained in that way, providing the intermaxillary elastics are worn for six or eight months, so that the teeth may thoroughly settle into normal occlusion. They can also be retained by putting a little vertical spur upon the lower teeth, and having this spur strike back of a horizontal plane attached to the upper teeth.

As to the case of unilateral distal occlusion in which Dr. Rogers asks if the frenum had been shifted, I will say that considering the age of the patient I did not wish to try to jump the bite forward on that one side. The patient was twenty-one years of age, and I found this a very easy and satisfactory method of doing it, but I presume that if I had another case of that kind, in a younger patient, I would not do it that way.

As to the intermaxillary elastics being first used by Dr. Baker, I was particular in saying that they were first used with marked results by Dr. Baker. There seems to be a controversy regarding their origin, and I think it possible that two or three men might use the same idea unknown to each other. I am satisfied that their use was original with Dr. H. A. Baker, and he has certainly obtained wonderful results with them.

As to bringing the lower jaw back—that is, in mesial occlusion—I may say that the same means can be used for retention in that class of cases as in the upper arches. You have to depend on the interlocking of the cusps of the lower teeth or to the spur and plane attached to the lower and upper teeth respectively.

Dr. ROGERS. I do not believe it wise in cases of this kind to depend upon the interlocking of the normal occlusion for retention, because sometimes after several years they will move back again. Now, it is very much easier and safer to put a little spur on the teeth, and so relieve the patients of those long months of inconvenience of wearing the appliance after

the case is done. This appliance can be put on the molars or bicuspid, but ordinarily on the molars with the best success.

On motion the subject was passed, and Dr. J. E. POWER, Providence, R. I., read a paper on "Necrosis," illustrated by the stereopticon. (Printed in full at page 1017 of the current issue of the COSMOS.)

There being no discussion of Dr. Power's paper, motion was made and carried to adjourn until Thursday morning.

THURSDAY—*Morning Session.*

The meeting was called to order Thursday morning at 10 o'clock by the president, Dr. Wm. P. Cooke.

The first item on the program was a paper by Dr. GEORGE T. BAKER, Boston, on "The Importance and Care of the Temporary Teeth." (Printed in full at page 1007 of this issue of the COSMOS.)

Discussion.

Dr. COOKE. There is no subject of more importance to us as dentists than that which Dr. Baker has just given to us. A number of years ago a paper was read before the Odontological Society in which the author said that there were something like fifty thousand deaf mutes in this country, and the opinion was given in that paper that out of these fifty thousand, thirty-five thousand, had they been properly cared for when children, would have been able to hear and talk as well as the rest of us. The same thing is true of the eyes. There are a great many people who become blind in their infancy simply from the lack of proper care at that time. With regard to the teeth, by the time the child is ten or twelve years of age the question of whether that child will have good teeth or not is settled. We spend a great deal of time in dental meetings telling how to put on crowns and bridges, and pay very little attention to the work which really should be considered first, the question of stopping these initial cavities in the teeth of children. Dr. Ottolengui read

a paper several years ago in which he advocated the filling of initial cavities with gold. Now, if you wait until those teeth can be filled with gold, you have waited too long. In the cases of the first molar, in nine out of ten cases there is initial decay, and this should be filled before the tooth is fully erupted. I have seen many cases where the decay has gone on so rapidly that the pulp is exposed before the root is completed. In cases where the pulp is exposed in the first molar before the patient is ten years of age, there is, to my mind, only one course to pursue, and that is extraction. Extract the tooth and give room for a good tooth to take its place. I shall have to differ from Dr. Reoch's idea that these spaces, when the teeth are extracted, should be preserved rather than allowed to close up.

It seems to me that Dr. Baker has brought before us a subject which should be emphasized. The object is to get these little mouths when the trouble has first started. After these cavities have gone on to any extent, the little patients will contract the habit of swallowing the food without chewing it, on account of the pain which it occasions, and of course such habits affect very materially the whole system.

Dr. N. A. STANLEY, New Bedford. I agree with the last speaker when he says that too much care cannot be exercised in the treatment of children's teeth. It is a subject of which very early in my practice I recognized the importance. Not only is it often due to the comfort of the little patient, but it teaches them to take proper care of their teeth in after life. We sometimes meet with a crowded condition in these teeth where approximal cavities are in evidence. One of the best ways to treat such cases is to fill their spaces with gutta-percha base-plate. It will stay there as well, if not better, than any other material, and its expansion will assist somewhat in the growth and enlargement of the arch.

A slightly crowded condition may arise from allowing the second molar to remain too long, as this tooth is considerably larger than the bicuspid which occupies

the space later. We may assist nature to carry out her plans, but any radical interference will result disastrously. Through the accidents and battles that accompany this period of our existence, the pulps of the incisors now and then lose their function, and the root is not readily absorbed. I have been at a loss sometimes to know just the best thing to do. A large shell is unsightly, but may remain for one or two years if the tooth shows no signs of loosening, and be finally extracted.

Dr. IRVING H. POMEROY, Gloucester. I had a little son fall and break three of his front teeth when he was two and a half years old, and on account of the pain and discomfort it seemed advisable to extract. He is now eight years of age, and the permanent teeth have come into place very nicely.

Dr. G. A. MAXFIELD, Holyoke. With regard to the treatment of cavities in temporary teeth I want to say a word about Ames' oxyphosphate of copper cement. You can place this where you can hardly place anything else. We very frequently find children's teeth so sensitive that it is almost impossible to clean out the decay at all. Now, you can manage these cases with this cement. It is not always necessary for the cavity to be perfectly dry, as the cement will adhere to the walls of the cavity, and becomes very hard. It is not only a non-conductor, but it is a strong antiseptic, and I think is one of the best filling materials we have for temporary teeth. The only objection seems to be to the taste of it in the mouth. I had one little boy tell me that he did not like the water I used in his mouth. I placed that cement in one of my own teeth where I could make nothing else stay, and it has been there now for six months.

Another thing in reference to children's teeth that has been a source of much regret to me is the way they are taught to think of the dentist. Last Saturday afternoon a little boy was brought to my office with the toothache. I was busy at the time, and had to keep the nurse waiting for several minutes before I could look after the child. I heard the little fellow crying in the reception

room, and when I went out to see him he would not let me come near him. Finally, I had to have the nurse hold the child and let me look into his mouth, but I was unable to do anything else. I said to the nurse that I could do nothing with him, and she suggested that she hold him, and let me work on his teeth. I said, "No, not here! I will not force a child." "Well," said the nurse, "I suppose I am to blame for this, as I had hard work getting him to let me brush his teeth, and so I told him if he didn't let me clean them I would have to take him to Dr. Maxfield, and have him clean them." Now, that impression will remain with that child for years. Many children come to us expecting to be hurt, and we can hardly do anything with them, all on account of the impressions they receive of the dentist in their early life.

Dr. J. F. DOWSLEY, Boston. With regard to Dr. Stanley's remarks as to how long to keep a deciduous tooth in which the nerve has been killed by accident, I remember an experience I had with a case of this kind, and I will repeat it for Dr. Stanley's benefit. A little boy, a nephew of mine two years old, fell and killed the pulp in a central tooth. For a while it was not discovered, but after it was, I had the nurse hold the child in her arms and I opened the tooth, removed the pulp, dried it out, and filled the tooth. The tooth was kept in the mouth and did good service until the proper time to lose it, and now he has the permanent one in good condition. That is how I treat cases of that kind. Even if the tooth be broken off, I try to keep it to preserve the space until the proper time to receive the second tooth.

In regard to the treatment of children's teeth, I think a great deal of good common sense is necessary on the part of the dentist. When I receive a little patient for the first time, of course the child has heard dreadful stories about the chair and engine, and comes to me in fear and trembling. The first visit is simply a little playing with the child to gain his confidence, and to show him that he need have no fear of the dentist. This play

consists in putting the little one in the chair, riding him up and down several times, showing him the mirror, and having him count how many teeth he has in the mouth; then show him the engine, which I call my humming-bird. I place a round ball-burnisher in the engine, and show him how it works by allowing the burnisher to run over the crown of a solid molar. Their whole experience for the first time is simply play, and the next time they come I have no trouble in accomplishing the necessary treatment. I have followed this plan for years, and have never known it to fail yet.

With regard to the subject of cleansing the teeth, I think that is simply a matter of education—a question of how the child is brought up; and we should be careful to instruct the parents as to the proper way to keep the children's mouths clean.

Dr. W. P. COOKE, Boston. It has been my privilege to belong to the Massachusetts Society for twenty years, and in many instances I have received enough information from one paper heard here to repay me many times over for all the money I have spent on the society in those twenty years.

Dr. Dowsley's remarks remind me of a paper that was read before this society some years ago—by a man from Toronto, I think—on the care of children's teeth. The particular part of the paper that impressed me was the way he said he managed children. When the child was first brought to him he pictured to the little one that it was bad fairies that were causing the trouble in his teeth, and he would try to get them out. He told them that he would have to break in the top of the house to get them out, and in this way he was able to drill into the tooth, and if the tooth hurt, he would tell them that that was a bad fairy screaming. Thus he went on with the work after he got the child absorbed in the fairy story. After he broke in the top of the house he would tell them that he would have to clean it out and run the bad fairies out and stop it up so that they would not get in again and cause him more trouble. I have followed that scheme many times since then, and I have found that it

works very nicely. And I think that that one point gained at a meeting of this society has been worth more to me than all the money and work that I have put into it since I first became a member.

Dr. GEO. T. BAKER, Boston (closing the discussion). I am very much gratified at the discussion of the paper, and I will say that it has repaid me many times over for writing it. I am glad to know that the general idea seems to be not to extract children's teeth simply because they ache. I think I can truthfully say that I haven't extracted a child's tooth in many years for the above-mentioned reason. In fact, I cannot remember when I did extract one, except very

soon after graduating from college. In college I used to extract a great many teeth, and I think students get in the habit of extracting teeth when at college, and when they get out they apply the same habits to their practice. When I graduated twenty-five years ago it was quite common to extract these temporary teeth indiscriminately, but now I think the tendency is growing considerably toward the idea that they should not be extracted except to allow the permanent teeth to take their position.

Dr. E. O. KINSMAN, Cambridge. The paper referred to by Dr. Cooke was one by Dr. Eaton of Toronto.

(To be continued.)

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Devoted to the Interests of the Profession.

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PHILADELPHIA, DECEMBER 1904.

EDITORIAL DEPARTMENT.

MUCIN AS A FACTOR IN DENTAL CARIES.

WE publish at page 1086 of this issue a brief *résumé* of a paper by Dr. A. Lohmann of Cassel, in which the writer claims for the mucin constituent of saliva a prominent rôle in the causation of dental caries. His contribution is published in full in *Archiv für Zahnheilkunde* for June 1904. The claim is novel, not to say startling, in view of the fact that we have come to be pretty well assured that the problem of the etiology of dental caries has been practically settled through the researches of Miller and those who have confirmed his observations by further research. Indeed, so revolutionary does the claim of Lohmann at first reading appear that one's feeling regarding it is well expressed in the words of Prof. Miller himself in his paper which we publish in this issue, as follows: "The view recently promulgated by Lohmann that caries of the teeth *is due solely to the action* of the mucin of the saliva stands at variance with some of the simplest facts of dental pathology and bacteriology to such an extent that it hardly seems indicated to enter into a discussion of it here."

In view of the sweeping character of Lohmann's claim the criticism of Miller above quoted does not seem to us to be unwarranted, yet a careful reading of Lohmann's paper leads us to feel that in spite of his sweeping generalization he has raised certain questions regarding the relation of mucin to the causation of dental caries which cannot be so summarily dismissed, and which are entitled to thoughtful consideration.

We think it has been demonstrated to a finality that dental caries is conditioned upon bacterial activity, and that the dissolution of tooth-structure is in the first place brought about by acids, which agents alone have the power to dissolve the calcium phosphate of tooth-structure. It has also been demonstrated that the bacteria concerned in the production of dental caries generate lactic acid as a result of their fermentative action upon carbohydrates, and that the lactic acid so produced dissolves the calcium phosphate of the tooth. It has not, however, been shown that mucin may not be a factor in the process. Lohmann's claim that mucin is capable of directly producing caries, if such be his position, cannot be taken seriously in view of what is already known of the carious process.

The data regarding the properties and composition of mucin to which Lohmann directs attention are, however, of such a character as to be worthy of investigation. The fact that mucin is in itself acid in character would indicate that it has a solvent action *per se* upon tooth-structure. This fact seems to have been verified by Lohmann's experiment, in which he shows comparatively the solvent action of mucin and lactic acid respectively upon teeth. But granted that mucin will dissolve tooth-structure, it must be borne in mind that simple tooth-solution is not tooth-caries; nor can anything even simulating caries be produced in a tooth by the direct application of acid solvents. Chemical erosion might be so produced, but caries is not erosion, and has nothing in common with it so far as its microscopical appearances are concerned. Two facts in connection with Lohmann's contention seem to us to be of importance. First, that caries is more prevalent in mouths characterized by a viscid, stringy saliva; this we think will fully accord with the results of clinical observation, and the viscosity of the saliva we believe is rightly attributable to its abnormal content of mucin. Second, the fact that there is a 25 per cent. carbohydrate moiety in the chemical composition of mucin, and it would seem not improbable that this carbohydrate feature of mucin might possibly form a fermentable pabulum for the action of the lactic-acid group of bacteria through the activities of which tooth-caries might result.

In addition to the points adduced by Lohmann in favor of his mucin theory, it is noteworthy that the saliva of arthritic individuals, who are generally immune from dental caries, is also lacking in mucin—indeed, in many it is almost totally absent as a constituent of the saliva. The question raised by Lohmann is an interesting one. Some of his deductions do not seem to be warranted by the evidence presented and especially in view of what is already known of the causation of dental caries, but there is much about this important question that is still unsolved, especially regarding the fact of the immunity from this disease which is enjoyed by many individuals. And we are more and more impressed with

the belief that the chemical composition of the saliva is the key to the situation. Hygiene of the mouth is not sufficient to explain immunity, nor does an unclean mouth explain susceptibility to caries. Clinical observations refute both possibilities. Something in or something lacking in the composition of the saliva which determines its suitability as a pabulum for the development of caries-producing fungi seems to us to be a guess much nearer to the truth, especially as the variability in composition of the saliva in different diathetic states is in fairly close relation to immunity and susceptibility to caries in various individuals. We know little of the meaning and function of mucin as a constituent of the saliva. It offers an interesting field for study. We should know all that it is possible to know about the composition of the oral fluids, and as a matter of fact we must possess this knowledge before we can settle the question not only of caries but of many other oral conditions. Therefore we feel indebted to Dr. Lohmann for directing attention to this matter, which, if not as important in its bearings as he is inclined to regard it, is at least of sufficient importance to be worthy of careful and systematic study.

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The present trend of medical education is toward specialization. Experience has shown conclusively that the average mind is incapable of grappling with the multitude of subjects which together constitute the realm of medicine. While dental and medical teachers do not always agree upon all educational questions they are nevertheless unanimously in accord upon the character of the teaching of the fundamentals of the science, which should be thorough and complete. Every specialist must perforce have a detailed and precise knowledge of the structure and function of the region under his immediate care; and, as knowledge of that kind cannot be acquired without a previous reasonable degree of familiarity with the anatomical and physiological characteristics of the entire body, the conclusion is self-evident that the specialist, whether of the eye, throat, nose, mouth, genito-urinary system, digestive tract or any other department must possess a thorough insight into the subjects of general anatomy, general physiology, general therapeutics, general pathology, general bacteriology, etc.

In the practice of dentistry we not infrequently meet with cases the nature of which could not be diagnosed without an understanding of the nerve relationship of the part to the rest of the organism, and particularly so in disturbances of the reflex type. We are also calling upon the kind of information derived from the study of the general subjects already enumerated in the diagnosis and treatment of all oral manifestations of a constitutional order and *vice versa*. A comprehension of special pathology is impossible without a knowledge of the principles upon which is based modern general pathology. The problems of general pathology would be unsolvable without the assistance rendered by general anatomy and physiology.

The book before us presents in a clear and concise manner the essentials of general anatomy required by the special dental practitioner in order to carry out his work in harmony with the advanced status of dentistry.

The book is divided into six parts, and in its 389 pages the reader will find easily assimilable information upon the structure of the entire human economy. The value of the book is enhanced by the character of the typographical work, which is good and in accordance with the adopted standard of the publishers.

J. E. D.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Dental Summary*, November 1904.]

TREATMENT OF PUTRESCENT PULPS AND ABSCESES. BY JOHN MISTR. CLEVELAND, OHIO.

The remedial agents used in the treatment of putrescent root-canals should be non-coagulants, as diffused medication is eminently essential and diffusibility is not attainable when coagulants are employed. The use of the essential oils of cajuput, eucalyptus, clove, and cassia is advocated by the author. The oils of eucalyptus and cajuput (when protected from the light) are practically colorless, and may be used in the anterior teeth without fear of causing discoloration.

In the case of a putrescent canal, after gaining access to the chamber it is washed out with 3 per cent. hydrogen dioxide. At the first sitting no attempt is made at complete removal of the canal contents, for after disinfecting for a few days there is less danger of forcing septic matter through the apical foramen. After removal of debris the post-operative treatment will consist of dressings of oil of cloves or cassia. Before filling, the canals are wiped out with 50 per cent. sulfuric acid, as suggested by Dr. Callahan; the acid is neutralized with sodium bicarbonate. In the case of abscess with fistula, aromatic sulfuric acid is pumped through the tract. For the filling of accessible canals the author uses such root-filling material as chloro-percha, gutta-percha, or zinc oxychlorid; for inaccessible canals he recommends the following paste:

Iodoform,	3j;
Bismuth subnitrate,	3ij;
Carbolic acid,	gtt. vj;
Mucilage of acacia,	
Glycerin,	ââ q. s. to make paste.

[*Revuc des Maladies de la Nutrition*, Paris, October 1904.]

THE MORBID FIELD AND NUTRITION. BY DR. F. DE GRANDMAISON.

After reviewing the investigations of Pasteur the author begins the discussion of the subject embodied in the title of his communication by defining nutrition, which he

states to be the aggregate of biological, physical, and chemical phenomena which assure the development and preservation of normal life and the eradication of the troubles from which our organism suffers more or less constantly. The phenomena of nutrition have for centers or laboratories the cellular elements which together constitute the different organs of our system. The physiologic functions of each and every living cell may be separated into three acts: first, they take from the surrounding media the elements necessary for their nutrition; second, by the inherent activity of their protoplasm they modify and transform these elements in such a way as to facilitate the absorption of their vital principles; third, they throw out the non-assimilable products and the debris formed in the course of the vital metamorphosis of protoplasmic activity. In more concise terms it may be said that cellular activity implies the accomplishment of three functions: absorption, assimilation, and dissimulation. Life is a result of the constant equilibrium of these three essential acts. It is not sufficient to consider only one single group of cells. All cellular groups are dependent upon each other, and health is the result of an harmonious activity between these different varieties of cellular elements. The muscular cell, the pulmonary cell, the digestive cell, etc., are dependent upon each other for their normal work. Finally, all these cells of the organism are considerably dependent upon the nervous cell, the function of which is, by means of its prolongation the nerve fiber, to transmit to all the different organs which constitute the body the impulse which puts the machinery in motion.

If we were perfect organisms our lives would be equally perfect. We would always be in perfect health, never weakening or becoming old. Unfortunately we have constantly to deal with external agents susceptible of modifying the vital reactions. We create for ourselves artificial and fictitious needs, habitual generators of dangerous poisons. We work our organisms without any attention whatever to their strength, instead of economizing our vital forces as much as possible. Furthermore, through heredity our vital forces receive at times disturbing im-

pulses which interfere with the regularity and good functioning of our organs. All these detrimental influences create opportunities for the establishment of morbid fields. Nutrition regulates and governs the receptivity of the organs to pathogenic influences. The nearer to perfection the vitality of an organism, the greater will be its degree of resistance to infectious and pathologic agents. It is a clinically observed fact that sober and sufficiently active young men are better able to resist the influence of infectious agents than are mature or aged adults. The author has observed that in military hospitals the young soldiers free from serious functional disorders easily overcome those acute diseases which generally terminate fatally in the adult or aged patients of civil hospitals. This is because at the age of twenty the human body is possessed of a powerful degree of vitality and resistance from the fact that at such an age the different organs have attained as perfect a development as may be ever expected, whereas later in life they will suffer from fatigue due to work and from other causes which lower the resistance of the human economy.

The author then asks whether it is possible from clinical signs to estimate the character of body reactions. This, it is found, may be accomplished in several ways: by the weight of the body, by the manner in which the bodily functions are carried on, and by urinary examinations. The variations in weight furnish valuable data. Every one of us, according to height and age, should weigh a determined number of pounds. This is what Gautrelet in his several studies has designated as the biologic weight, or more correctly the biologic coefficient. This coefficient represents in the case of each individual a quantity of living matter which must undergo the nutritive metamorphoses indispensable to the preservation of life. If the weight be markedly below normal it is a sign that the assimilable material available is insufficient relatively to the degree of activity expended; the organism is burning more fuel than it receives and is therefore in bad condition to defend itself against disturbing factors. If, on the other hand, the weight be higher than normal, the opposite has occurred; the individual is using up less energy than is supplied by the material taken into the body. The surplus of assimilable principles introduced is converted into fat, which accumulates in the muscular and visceral interstices; nutrition becomes sluggish. Men of this class are less vulnerable to infectious diseases, but nevertheless may become sufferers from other serious pathologic disturbances.

The author does not touch on the data which may be obtained from careful examination of the several organic functions, but deals, however, with the subject of urinosemeiology. The urine, as it contains the most important excretory principles of the entire organism, furnishes by means of clinical analysis a statement of whatever morbid condition may be present. Gautrelet, in his work on urinary semeiology, divides individuals into two great classes: first, the hyperacids, those in whom nutrition is deficient; and the hypoacids, those in whom nutrition is considerably exaggerated. These two types of diathesis constitute morbid fields which will react differently toward infection. The knowledge acquired in the bacteriologic laboratory agrees with our observation in the human body. It is a well-known fact that microbes thrive in alkaline media, and that it suffices to acidify them to interfere with and even arrest definitely their growth. It is therefore reasonable to admit that the more acid the secretions of the body are, the more difficult will it be for microbes to develop in them.

Hand in hand with a decrease in acidity will the facility for micro-organisms to develop increase, inasmuch as pathologic organisms will find under these conditions a medium suitable for their growth and development. It is perhaps here that we find the readiest explanation of the difference in the diseases encountered in hospital and in private practice. Frequently the well-to-do patient is of the hyperacid class, while hospital patients are of the hypoacid. In the course of a series of observations made by Gautrelet in a Paris hospital he found hypoacidity in all the patients. Only the chief of service and his students were hyperacids. Acute infections take on a serious aspect in hospital patients because of their hypoacid diathesis. On the other hand we find that the private patient is frequently the subject of gout, diabetes, and all the manifestations of arthritis.

The normal equilibrium of the organism is obtained by an equation between assimilation and dissimulation. In the hypoacid diathesis assimilation is on the decrease, while dissimulation is on the increase. Assimilation is diminished because of insufficient nutrition, defective domestic hygiene, and a marked decrease in oxygen supply. That nutrition in such patients is insufficient is a statement which hardly needs to be explained. The laboring classes, who depend for their living upon a small income, deprive themselves of many articles of food which would otherwise furnish them with the

amount of albuminoid and ternary elements necessary for the preservation of health. They live in limited quarters insufficiently ventilated; they work in unsanitary shops containing scarcely the amount of oxygen necessary for the functions of the body. Assimilation, it should be understood, implies not only nutrition, but also those physiologic acts by means of which we take from the surrounding atmosphere the several necessary elements which the body requires. But the most serious error in the hypoacids is due to an exaggerated dissimilation.

Here the author discusses the detrimental effect of alcohol upon the functions of the body, recalling the well-known fact that alcoholics are more prone to the ravages of tuberculosis than are men of temperate habits.

In the hyperacid diathesis the reverse condition of things is present, assimilation being on the increase, and dissimilation on the decrease. This diathesis is found among people of wealth and among members of the liberal professions. Assimilation is here exaggerated; they lack the necessary proportion of ternary elements.

Hyperacids as a rule take no physical exercise; they seldom give any active play to their muscles, living confined in their laboratories or offices. The hyperacidity present modifies their receptivity to infectious diseases, which they are less liable to contract than are the laboring classes; but they easily acquire the diseases that are characterized by slow dissimilation—namely, rheumatism, gout, diabetes, etc.

[*Nordisk Tandläkare Tidskrift*, No. 3, 1904.]

POINTS ABOUT VULCANIZATION. BY DR CHRISTENSEN.

Dr. Christensen in this article gives some interesting facts about the vulcanization of rubber. The conclusion he arrives at after a number of experiments is that vulcanization, in order to produce the best results, should take place in *steam* only, at 320° F., and not in water at the same temperature. The purer the rubber is, the greater is the necessity of keeping the flask out of the water. In rubber containing a great deal of foreign material no particular difference is noticed. The following experiments are self-explanatory:

Experiment 1. 300 gm. water in the vulcanizer. Used two flasks, in each of which were placed blocks of rubber (eight thicknesses of ordinary rubber sheets)—in one pure rubber, in the other rubber mixed with foreign material. Time consumed to reach

320° F., twenty minutes; allowed to remain at that temperature one hour and forty-five minutes. Result: Pure rubber altogether porous; mixed rubber free from porosity.

Experiment 2. 200 gm. water in the vulcanizer. Blocks of the same size as before. Only pure rubber used in this and the following experiments. Time taken to reach 320° F., thirty minutes; vulcanized at that temperature one hour and forty-five minutes. Result: All blocks porous, but blocks in the upper flask less so than in the lower.

Experiment 3. 125 gm. of water. Lower flask empty; in upper flask the usual rubber blocks. Time and vulcanizing temperature same as before. Result: Perfectly free from porosity.

Experiment 4. 100 gm. of water. Blocks in both flasks. Time and temperature the same. Result: Blocks in lower flask all porous; blocks in upper flask entirely free from porosity.

J. E. HEYKE, D.D.S.

[*Odontologie*, Paris, October 15, 1904.]

CONSEQUENCES OF A HEMIHYPERTROPHY OF THE FACE UPON THE DENTAL ORGANS. BY DR. LUCIEN CLERC, CHIEF OF LABORATORIES, DENTAL SCHOOL OF BORDEAUX.

Facial hemihypertrophy is a congenital deformity. Very rarely is it an acquired disease, although it may be brought about by traumatic lesions or trigeminal neuralgia. This interesting pathologic question has been made the subject of several series of investigations. The first work on the subject was done by Bock, who in 1836 published the case of a little girl aged three years the subject of facial hemihypertrophy affecting the soft tissues only. Other cases have been reported by Ollier in 1862, by Friederich in 1863, by Passauer in 1866, also by Trélat, Monod, and others.

In 1897 Drs. Sabrazés and Cabannes of the Faculty of Medicine of Bordeaux published a paper on this facial deformity with observations similar to those which we are about to relate. This affection must be classed in the group of hypertrophies—hypertrophy of the osseous tissues and of the soft tissues of the face. It cannot be considered a facial hyperostosis, this being as a rule an acquired condition brought about by an osseous deposit of periosteal origin while the soft tissues remain unaffected. The symptoms of facial hemihypertrophy are all objective. One side of the face only becomes hypertrophied, the abnormal development being limited to the zygomatic process, to the ascending

ramus and mental region of the mandible, to the maxilla and the nasal bone. The soft tissues of the cheek may likewise grow to abnormal proportions, producing a thick, hanging cheek, at times of a deeper color than the adjacent tissues. The alveolar process may also become the seat of the hypertrophic process, and occasionally the teeth also show marked signs of abnormal growth. Circulatory disorders are known to result from the condition under discussion, particularly angiomas.

The author then describes in detail a case of hemihypertrophy of the face of congenital character, together with the deformities of the jaws and teeth consequent thereto. It was that of a young boy, the affected side being the right. The hypertrophic process had affected not only the hard and soft tissues of the right region of the face, but also the right palatal process of the maxilla, the right alveolar process, and the deciduous upper right second molar. Upon the mandible, on the right side, abnormal growth had also taken place and had effected the deciduous lower right second molar. Plaster casts of the child's mouth were obtained during the evolution of the deciduous teeth at the ages of nine and ten, after eruption of some of the permanent organs had taken place. At ten years the hypertrophic growth had increased proportionately. The right upper teeth were very much larger than those on the left side, and the right first molar was of voluminous size. In the mandible the permanent teeth erupted earlier than in the maxilla, and presented upon the right side the same hypertrophic characteristics as were evident on that side of the face. The author also carried out histological examinations from sections of teeth of the affected side which had to be extracted—one because of deep caries and the other to remedy if possible the marked and unsightly irregularity present. These examinations, however, revealed nothing of importance bearing on the pathogeny of the case.

[*UOdontologie*, Paris, October 30, 1904.]

THREE CASES OF PATHOLOGIC ERUPTION OF THE LOWER THIRD MOLAR.

BY DR. LEON FREY.

The author has observed a number of cases of difficult eruption of the lower third molar, and here reports a few of particular interest to the practitioner.

The first case was that of a man in his fifties. For over ten years he had been a sufferer from a series of phlegmons both submaxillary and gingivo-buccal. Those within

the oral cavity had gradually caused the loss of a considerable amount of alveolar tissue, to such an extent as to cause the loosening of the first and second molars, which were removed by the patient himself. The patient being of the rheumatic diathesis the diagnosis of pyorrhea alveolaris was made, and as all the remaining teeth were firm in their alveoli the patient hoped that the disorder had come to a standstill. But it was not very long afterward that he was brought by his physician to Dr. Frey suffering excruciatingly from a gingivo-buccal abscess in the same region in which previous ones had developed. With the exception of the space produced by the loss of the two teeth above referred to, the mouth was in perfect condition. All the third molars excepting the lower right one had erupted. The patient could not throw any light on this anomaly. The mucous membrane throughout the mouth presented a healthy appearance. Close examination revealed a depression at the base of the ascending ramus, and through a small opening an exploring sound was introduced, which after following a tract about two centimeters in depth through roughened bone edges came finally into contact with a smooth, polished surface easily diagnosed as enamel. The offending tooth was removed under chloroform, cicatrization was complete in six weeks, and since the operation was performed, in April 1894, the phlegmons have not reappeared.

The second case was that of a woman aged seventy-six in whom had developed an indurated swelling extending from under the right mandibular angle down to the clavicle. The patient did not suffer any pain whatever, and the physician having diagnosed the disturbance as a lympho-sarcoma had decided not to operate owing to her advanced age. In the interim the patient visited Dr. Frey about a carious lower molar. During the examination it was observed that a sound could be made to penetrate back of the carious tooth for a short distance, then striking a hard, uneven surface like the occlusal plane of a molar. The patient was positive in her assertion that in that particular side the third molar had never erupted. The inclosed tooth was removed with difficulty under cocaine anesthesia, and two months afterward not only had the intra-buccal wound completely healed, but the so-called lympho-sarcoma had disappeared.

The third case was that of a man aged fifty. For about two months he had been suffering from a trismic condition which rendered almost impossible the ingestion of the smallest quantity of food. At times a sup-

purating condition would develop about the left cheek. His dentist had diagnosed the case as one of impacted tooth, but after a long hour's work with the patient under chloroform had failed to remove it. Dr. Frey succeeded after a most careful operation, which necessitated the removal of part of the alveolar border underlying the tooth before any attempt at extracting could be made. The wound had entirely healed and the trismus had disappeared only after four months of careful post-operative treatment.

These three cases are interesting, particularly in view of the patients' ages, one being seventy-six and the other two fifty years of age.

[*Revue Odontologique*, Paris, October 1904.]
ACCIDENTS DUE TO BORIC ACID. By

DR. MERKEL.

Boric acid is not as innocuous a remedial agent as one may be inclined to believe. Stokvis has described a case of poisoning which terminated fatally, brought about by the washing out of the stomach with 300 gm. of a 2½ per cent. solution of boric acid. Nussbaum and others have observed cases of urticaria, purpura, and erythema following the external application of boric acid. In Germany it has been recently found that a number of cases of systemic disturbance were due to the ingestion of meats which had been preserved with boric acid, and laws have been enacted to prevent its use in foodstuffs.

Dr. Merkel (*Journ. de Pharm. et de Chimie*) after a series of experiments concludes that boric acid is practically non-toxic. He administered daily gr. xxx (2 gm.) of boric acid to eleven patients. Four tolerated it without inconvenience, but in the remaining seven it brought about tympanites and diarrhea. In several of these patients the proportion of urine increased considerably, showing conclusively that boric acid has a certain diuretic action.

[*Archiv für Zahnheilkunde*, June 1904.]

A NEW FACT ABOUT DENTAL CARIES.

By DR. AUG. LOHMANN.

The author believes that mucin has a decalcifying action upon the enamel of the teeth. He has observed that people whose salivary secretion is abundant, with mucin in large proportion, have a considerable number of carious teeth, and that the caries process is more rapid when the saliva is decidedly viscid. He has carried on a series of investigations and found that mucin has as strong a decalcifying action as lactic acid. A molar weighing 2.131 gm. suspended in the mucin

obtained from the saliva of a girl aged eighteen weighed only 2.112 gm. at the end of the thirtieth day. The saliva of pregnant women contains a great proportion of mucin and is therefore more decalcifying than that of the normal subject. A tooth weighing 2.066 gm. suspended in the saliva of a pregnant woman weighed only 1.777 gm. after thirty days' sojourn in the fluid. An experiment was made with lactic acid in 2 per cent. solution. A tooth weighing 2.117 gm. was allowed to remain in this solution for thirty days. At the conclusion of the experiment it weighed 2.072 gm. It should be remembered that lactic acid is present in the salivary fluid to the extent of 0.75 per cent.

The effects of the presence of mucin upon the surfaces of teeth and mucous membrane can be neutralized by the action of slightly astringent and antiseptic solutions, or by means of a physiological salt solution, which is a solvent for mucin.

[*Dental Summary*, November 1904.]

CONSERVATISM IN THE TREATMENT OF
LOOSENED LOWER INCISORS. By
CHAS. C. CHITTENDEN, MADISON, WIS.

The author calls attention to a method which he has successfully employed in the treatment of loosened lower incisors. The inflamed condition surrounding a sore and loosened tooth should be treated by first relieving the affected organ from contact with its antagonists and by holding it in as nearly as possible a stationary position. This last requirement may be temporarily accomplished by the use of silk ligatures, which properly applied will secure a very considerable firmness in a very loose tooth, and in case of undue prolongation will permit the use of the carborundum wheel for freeing the bite with the infliction of little pain. All calcareous deposits should be removed and stimulating dressings should be applied. This method of treatment will be followed in two or three days by a subsidence of the inflammation, when a more thorough cleansing of the tissues may be effected. The ligatures should be renewed and made as effective as possible.

This treatment should be pursued until the inflammation has entirely disappeared, when the teeth should be permanently fixed with a lasting appliance. The device which the author recommends consists of a square bar—of gold-clasp metal to make it stiff and firm—cemented into a groove cut across the incisal edges of the loosened organs. The ends of the bar may be turned down to give the general effect of a stiff staple, to be let into the teeth forming the abutments.

PERISCOPE.

Sensitive Labial or Buccal Cavities.—

Erosion areas at the gum margin can be prepared for the insertion of filling, with but little pain to the patient, by applying dry tannic acid. This will not produce any bad after-effects.—I. NELSON PLATT, *Dental Review*.

Partial Impressions in Plaster.—

Vaseline the teeth, especially for a second impression at the same sitting, gives a sharper impression and greatly facilitates the removal of the plaster. Apply the smallest quantity of vaselin, in the meshes of a bit of cotton; this fully realizes all reasonable expectations.—*Dental Office and Laboratory*.

Adenoids in Infants.—

Herman Jarecky, New York (*New York Medical Journal*, August 13, 1904), reported to the Society of the Alumni of the City Hospital five cases of adenoids in infants, two eight weeks old, one nine weeks, one ten weeks, and one eight days. All were operated upon with success except the last, in which case operation was postponed to the age of four years on account of opposition by the father.—*Cincinnati Lancet-Clinic*.

Radio-active Wool.—

A new method of employing radium in medicine has been described by E. S. London, a Russian physician, which consists of using cotton-wool which has been submitted to the reaction of radium emanation. The result of a series of experiments seems to justify the conclusion that the effects of the radium emanation and of the direct action of the radium are the same, consisting in an inflammation of the skin and a destruction of protoplasm. Wool so treated, which is convenient for easy distribution over the body, when packed in hermetically sealed jars or other containing vessels, loses its radio-activity very slowly, and can be sent to any distance desired. From a few milligrams of radium a large quantity of wool may be prepared, and thus widely extend the use of a small amount of radium, whose cost is so great as to interfere with its widespread use. Radio-active wool, therefore, may become a stock pharmaceutical preparation, but it still remains for the medical profession to determine its therapeutic value.—*Canadian Journ. of Med. and Surgery*.

Injection of Osmic Acid for Tic Douloureux.—

The case of a woman seventy-one years of age, who presented an intense tic involving the right side of the face, is reported by J. R. Eastman (*Journal of the Am. Med. Association*, September 24, 1904). The attacks had become gradually worse during twenty years, and the usual remedies had been found ineffectual. A two per cent. solution of osmic acid was then injected into the supra-orbital, infra-orbital, and dental nerves, in the manner recommended by Dr. J. B. Murphy. Ten drops of the solution were injected into each branch, and two to three drops forced into the perineural fat around the nerves at their foramina of exit.—*Med. News*.

Occlusion and Articulation.—

The words "occlusion" and "articulation," so frequently quoted in dental literature, are often, it is believed, erroneously referred to. The term occlusion, for instance, is not uncommonly made to imply the several and distinct relations of the teeth as witnessed in the act of mastication; whereas, in my conception, the term can refer to only one movement—viz, to the closing of the jaws. Occlusion, therefore, refers to the normal relations of the inclined occlusal planes of the teeth when the jaws are closed (Angle). Articulation, on the other hand, is a name applied collectively to the relations of the lower teeth to the upper as exhibited in the several movements performed by the mandible during mastication.—JULIO ENDELMAN, *Internat. Dental Journal*.

Dermatitis of the Hand after Use of X Ray.—

A severe case occurring in a physician who had employed the rays continuously since 1897 is reported by R. Mühsam (*Arch. f. klin. Chir.*, vol. lxxiv, No. 2). During the winter of 1900-01 a dermatitis was observed, accompanied by scaling of the skin and localized temperature. The patient then ceased to employ the rays. The condition nevertheless grew worse, the nails became brittle and showed irregular growth, the skin was dry, and the hair fell out. The index finger of the right hand was most affected; here a paronychia resulted and the nail had to be removed. The wound failed to heal and an

ulcer remained which was very painful and gradually extended, causing so much discomfort that the patient begged amputation of the finger. This was done, but the wound did not heal until nine weeks later. Examination of the digit microscopically showed the most marked changes in the vessels. The intima was very much relaxed, the endothelium swollen, and the surrounding tissue was markedly infiltrated. The changes amounted to an obliterating endarteritis. In the partial or complete obliteration of the vessels must be sought the reason for the slow healing of the ulcer.—*Medical News*.

Precautions Frequently Disregarded in Administering Nitrous Oxid.—I am in the habit of teaching that nitrous oxid should never be administered to a patient (1) with a loaded stomach, *i.e.* within an hour of a meal; (2) with a full bladder; (3) with a tight neckband or tight lacing. These conditions, however, are repeatedly neglected in practice, and thus vomiting into the facepiece (with its attendant risk of asphyxia), micturition, cyanosis, and obstructed respiration should not be attributed to the N_2O , but to the neglect of the simplest elementary precautions prior to its administration! One is frequently tempted, in order to obtain a long anesthesia with N_2O , to continue the administration a little too far—on to the borderland of asphyxia, in which cyanosis, deep stertor, violent jactitation, opisthotonos, and a widely dilated pupil with insensitive conjunctiva are present, but this I feel sure defeats its own object and that time is lost, on account of the erratic movements and the awkward position into which the patient may subside in the chair, much handicapping the operator during extractions. It has been my custom for several years to stop the administration when I witness the presence of twitchings in the orbicularis oculi muscle at the external canthus. I believe this to be an invariable sign of anesthesia with N_2O , and I cannot recall any case where, in the adult, it has not been present. In young children the signs of anesthesia follow one another so rapidly that I have not found this sign so reliable; in their case it is advisable to stop the administration directly any sign of muscular twitching is present, otherwise arching of the back may follow very rapidly and the patient slip out of the chair on to the floor. Caution is also necessary in the case of phthisical patients, to stop the administration on the first sign of anesthesia and not to push the anesthetic; such patients are said to become more deeply anesthetized when the

administration is stopped and air admitted. This fact is in all probability due to defective elimination from the damaged lung; it is an undisputed fact that they do become more deeply anesthetized after removal of the facepiece, a phenomenon at variance with all experience with other anesthetics.—C. CARTER BRAINE, *Brit. Dental Journal*.

Ethyl Chlorid.—Ethyl chlorid has come much to the front during the last year or two as a general anesthetic in dental surgery, and one is apt to imagine that a new anesthetic has been discovered, whereas it was used by Heyfelder as a general anesthetic as far back as the year 1848. No anesthetic is being so extensively advertised at the present day as ethyl chlorid, and every firm of manufacturing chemists appear also to have discovered, in their own opinion, the best inhaler for its administration. I am not aware of any anesthetic reagent to which so many fancy names have been attached. The use of such terms is a mistake, and it leads one to suppose they are proprietary articles; ethyl chlorid should be known by that name and no other. It possesses many advantages over N_2O , as it produces insensibility with very great rapidity, the resulting anesthesia is of much longer duration, sometimes more than twice as long, and the character of the anesthesia is of a deeper and a more tranquil nature; besides these advantages, its portability in comparison with the gas cylinder is greatly in its favor. It is not uncommon to obtain two minutes' anesthesia after its inhalation, so that it will at once be recognized how useful this anesthetic is in dental surgery during difficult extractions; it is also admirably suited for the removal of tonsils and adenoids in children, the time at the disposal of the surgeon being ample. Although possessing all these good points, it has one disadvantage, and that is the tendency to after-sickness. You can never predict that it will not occur, and I have met with a few cases in which it has been very troublesome, lasting quite half a day; therefore I do not administer ethyl chlorid if there be a fair chance of completing the extractions under nitrous oxid and oxygen.—C. CARTER BRAINE, *Brit. Dental Journal*.

Employment of Hot Air in Dentistry.—I apply the dam and absorb the moisture as much as possible, and then evaporate it, using the merest breath of warm air at first, not employing a strong blast of hot air, for that hurts, while gentle whiffs are quite bearable. When the cavity begins to look white

I wet it several times with zinc chlorid in alcohol and chloroform, drying out as before, and increasing the blast as the patient is able to bear it. The zinc-alcohol-chloroform mixture, having an affinity for moisture, draws it from the dentin, thus leaving the cavity perfectly dry, and a non-conductor; so if you are quick about it and have a sharp bur in the engine, you can cut where you could not touch before. Another method I have found successful is to wet the cavity with methylene bichlorid, drying it out with cold air. With this you may use all the pressure you can get; the methylene evaporates so rapidly that it reduces the temperature and causes the pulp to contract. The cavity may then be cut in a bold way. It is a question, however, whether the rapid reduction of temperature is always a safe procedure, as it may cause some irritation of the pulp. The same thing might also be said of too much hot air. I have used a great many times in the dry cavity an application of eugenol and carbolic acid, sealing it in until the next day. We must recognize, however, that the use of many medicaments is unreliable; yet they seem to satisfy the patient somewhat, and perhaps the dentist, and in this way help out at least for the time being. The mechanical effect of the hot-air treatment in root-canals gives good results. Some men prefer to use compressed air from a cylinder. I have found, however, the foot-blower or a pair of double bulbs work very well for that purpose, although a single bulb will answer the purpose if one have a syringe that will hold sufficient heat. The air driven through with a great deal of force does not have time to get very hot, whereas if the gentle blast be used you get air hot enough to desiccate all the organic matter in the canal, leaving it in the best possible condition to absorb an antiseptic dressing. A strong blast may be used to drive the medicament into the small canals, and when the roots are ready to be filled they may be warmed up in such a way that chloro-percha may be driven into them, or a cone put in and afterward softened by the heat, allowing it to be forced into every part. Hot air will be found invaluable for removing crowns set with gutta-percha, and it may be done in half the time it takes to do it with a warm pair of forceps. In setting crowns with cement the heat is used for drying the tooth, and to hasten the setting of the cement—which is quite important in mouths where it is impossible to control the flow of saliva for more than a few moments. Some operators using high pressure claim they can blow

the gum and blood away from the end of a root or tooth in such a manner that particles of salivary calculus may be located.—FRANK B. NORRIS, *Dental Brief*.

The Mechanical Theory of Seasickness.

—That the malady known as seasickness is due to a disturbance of equilibrium is sufficiently evident, although just how this disturbance acts on the organism to produce its results has been a matter of much controversy. Under the above heading an article is contributed to *La Nature* (Paris, September 10) by Mons. R. Bonnin, in which the author, without going too deeply into physiology, explains at some length the purely mechanical factors involved in the question. He reminds us that when a body swings, pendulumwise, around a fixed point, its speed is variable. It is at rest just as it starts, moves faster and faster up to a maximum and then slows up until it stops just for an instant at the other end of its course. At any given moment it has three forces acting on it: its own weight, which pulls it directly down; the centrifugal force, directed away from the point around which it swings; and its own inertia, which acts in the direction of its motion. The first is of course constant in amount and direction, the second varies with the speed of the body, and the third with its position in its course. The result is that, during its oscillation, the total force acting on the body (sometimes called its "apparent weight") is continually varying both in amount and direction. This is the case on shipboard, where, M. Bonnin reminds us, these variations as the vessel rolls cause great strains in the structure of the ship, necessitating vast strength in the hull. The same is true of moorings or fastenings, which though ample to sustain the weight of a gun, for instance, may be snapped if the vessel roll suddenly.

M. Bonnin goes on to say: "Now replace such a body by a human being. He will be obliged at each instant to make efforts to put himself in balance with his 'apparent weight,' which is all the time changing in amount and direction. Again, his internal organs, suspended in the thorax and the abdominal cavity, will tend to oscillate continually, becoming displaced relatively to each other and pulling on their attachments. At certain moments the organs seem to rise, while at others they appear to grow heavier. Hence an effect of distress which may bring on nausea and is called seasickness when it arises from the motion of a ship. As the nausea results from the oscillations of the organs contained in the thorax and the ab-

dominal cavity, we see why the horizontal position may, up to a certain point, diminish the effects of seasickness. The effects produced by pitching on variations of weight are similar but of greater intensity, especially at the ends of the vessel, where, on account of its length, the displacements, even with slight pitching, are more considerable, and, consequently, the tangential forces are more important. It should be added that the hypothesis with which we have started to make this explanation clearer—namely, that the oscillations of rolling and pitching take place about a fixed point—does not accord exactly with reality. There is, to be sure, a point in whose neighborhood osculation is very slight; but experience and calculation both show that in the movement of a vessel there is no point that is absolutely still.”—*Literary Digest*.

The Psychic Factor in Nutrition.—In the healthy and well-balanced organism digestion is accomplished through mechanical and chemical agencies apparently so simple and automatic in character that, given foodstuff acceptable to the palate, sufficiently masticated for deglutition, and sufficient in amount for satiety, then the active personal relation of the eater to the digestive process is usually regarded as ended, an impersonal and much abused “nature” being trusted for further and ultimate results. This view of the most vitally important function of the animal economy, while perhaps valid as applied to the reptilia or still lower organisms, is not universally applicable to man, with whom psychic influences play a rôle in the digestive process increasingly important as he advances in the intellectual scale. How intimately dependent upon the mind in man are those chemico-vital processes by which nutritive matter is converted into living tissue and made contributory to the store of vital energy is shown by the instant and complete arrest of those processes under the shock of overpowering emotions, as of grief, rage, or fear. In persons of great nervous susceptibility partial or complete inhibition of digestion is a uniform consequence of even the minor forms of mental depression, such as are caused by anxiety, worry, disappointment, or chagrin. Indeed, the general impairment of appetite and digestion resulting from all depressing emotions is a phenomenon universal in human experience, while conversely, for their pro-

motion, happiness, cheerfulness, and contentment are everywhere recognized as among the most potent of all known agencies.

The difficulty of applying these axiomatic truths to the conduct of life lies in the fact that upon no man has been bestowed exemption from life's greater griefs, and that each has also his share of its minor sorrows; while the platitudinous injunction that the former should be borne with resignation and the latter with equanimity are as easy to inculcate as often they are difficult to obey. Like other forms of courage, the power to thus bear with fortitude and cheerfulness the inevitable vicissitudes of life varies with varying temperaments and dispositions; but it is a power which to some degree at least may be, and should be, cultivated by all. Nothing is more conducive to courage under misfortune than a sane and wholesome view of the true purpose of life and of the real essentials to true happiness. Under modern social conditions existence is becoming so complex that men are losing sight of its simple and elemental needs in the struggle to gratify wants which are artificial in their origin and intrinsically non-essential, if not detrimental, to their moral and physical well-being.

It is of course natural and desirable that men should strive to better their condition, but there is a wide distinction between that “divine unrest” which is the soul of all worthy aspiration, and the ignoble discontent which embitters life and wastes its energies in a ceaseless striving for paltry social distinction and a sordid struggle for wealth and power, which even if gained profit nothing because won by unworthy means and devoted to unworthy ends. Apart from the moral aspect of these wasteful perversions and misdirections of nervous energy so rife in modern society the world over, there can be no question that, regarded simply from the standpoint of physiology, they are among the chief psychic factors in the impairment of the nutritive forces of the organism, and that the aspirant for power and place and the social climber, who eat their bread in anxious bitterness of soul, or the business hustler, too absorbed in commercial cares to eat rationally or digest physiologically, are alike sapping the sources of vitality and setting in operation fruitful causes of an inevitable physical and moral degeneracy for themselves and their posterity.—*Dental Brief* (editorial).

HINTS, QUERIES, AND COMMENTS.

PRACTICAL HINTS REGARDING CRYSTALLOID OR SPONGE TIN.*

CRYSTALLOID or sponge tin as prepared by Dr. Arthur Scheuer, Teplitz, Austria, may prove to be a valuable adjunct to the dental armamentarium.

The pure tin as deposited in these crystals has a spongy, felt-like form, and under compression exhibits cohesive properties. The cohesion, however, is not sufficient nor can the mass be made dense enough, to warrant its use where contoured fillings are required. The crystalloid tin seems best adapted for small or narrow cavities where all the walls are intact, as in the sulci of bicuspid and molars; though it may be used in cavities that nearly cover the entire occlusal surface of a molar; but it is questionable if such a filling would prove as satisfactory as would a well-condensed amalgam filling. It may also be used in cavities in children's teeth where the preservative qualities of the tin are desirable.

The ease with which crystalloid tin may be manipulated and adapted is more than likely to lead to carelessness in its use. To insure uniform density throughout a filling of this material it is advisable to use small pieces, adapting each to the wall or floor of the cavity and thoroughly condensing it before more is added. The cavity should be gradually filled with these small pieces, each thoroughly condensed, until the margins are reached; the

final piece should be large enough to cover the entire surface of the filling and the margins. The surface should be thoroughly condensed with a broad foot plugger, then gone over with a corrugated engine burnisher, followed by a vigorous hand-burnishing. The filling may be dressed into shape with plug-finishing burs and disks.

Crystalloid tin may be combined with gold for filling large deep cavities, using the tin for the bulk of the filling and finishing with gold for the surface; following the method described by Dr. Scheuer. Though there is considerable adhesion between the crystal tin and crystal gold, it is not sufficient to be depended upon for the retention of the gold surface. It is better to give the marginal walls of the cavity a slight retentive form and have the gold of sufficient thickness to be thus held. When so combined, great care should be taken to have the tin thoroughly condensed before any gold is added, so that there may be no giving of the surface to prevent the making of a tight filling with the gold.

In deep cavities where the pulp is only protected by a thin layer of dentin it would be well to cover the floor of the cavity with a layer of cement rather than to fill entirely with the crystalloid tin, for the giving way of the tin under severe compression might endanger the pulp.

The crystalloid tin may be handled with impunity and without interfering with its cohesive properties. The scraps may be worked over again so long as they do not become contaminated or moistened.

F. C. BRUSH, D.D.S.

* See article "Two New Filling Materials: Sponge Tin and Tin-Cement," by Arthur Scheuer, DENTAL COSMOS for May 1904, page 399.

OBITUARY.

DR. HENRY CHARLES HOWELLS.

DIED, at his residence in Hamilton, Ohio, June 22, 1904, of heart failure, Dr. HENRY CHARLES HOWELLS, in his eighty-eighth year.

Dr. Howells was born in Steubenville, Ohio, October 23, 1816. He entered upon the practice of dentistry in 1838 and for two years practiced in Kentucky and Tennessee. In 1840 he moved to Hamilton, where he remained in practice up to the time of his death, a period of sixty-four years. He was a man of sterling qualities, and commanded the respect of everyone whose pleasure it was to meet him. His life was one of varied activity and full occupation, and his death marks the end of a long, honest, and useful career.

He is survived by a widow and five children.

DR. WM. C. HEPBURN.

DIED, at New Rochelle, N. Y., October 19, 1904, from acute myocarditis, WILLIAM C. HEPBURN, D.D.S.

Dr. Hepburn was born in New Rochelle, February 14, 1859. In 1876 he entered upon the study of dentistry by becoming an apprentice to Dr. E. Parmly Brown in Flushing, N. Y. He remained with his tutor until 1881, at which time he matriculated in the Baltimore College of Dental Surgery, from which institution he received the D.D.S. degree in 1882. Immediately upon his graduation he opened an office in Flushing, and a year afterward married Miss Sarah A. Scott of the same town.

Dr. Hepburn displayed interest in society matters, and as a member of the committee on dental law of the Second District Dental Society of the State of New York worked unselfishly and successfully in furtherance of the mission entrusted to the committee.

His thorough operative technique, his ability to convince patients of the necessity of carrying out his advice in questions relating to the health of their mouths, and his genial

personality won for him a large, lucrative, and appreciative *clientèle*.

He is survived by a widow and four daughters.

DR. CHARLES PARMELE GRAHAM.

DIED suddenly, at Middletown, Conn., November 1, 1904, Dr. CHARLES PARMELE GRAHAM, in his sixty-sixth year.

Though born at Utica, N. Y., June 6, 1839, Dr. Graham was of Connecticut ancestry, and received his early education chiefly in the common schools of that state, where he spent the greater part of his early life, as well as his later years. In 1858 he became a pupil of dentistry with Dr. Luther Parmele, who had at that time an office in Middletown, and from that time until his death he remained there and built up an extensive practice. He married, early in life, Miss Julia Bacon of Middletown.

December 8, 1871, Dr. Graham enlisted in the second regiment, Connecticut National Guard; nine months later he became lieutenant, and rapidly rose through the various grades, and in January 1885 he was promoted to be brigadier-general, serving until March 1890. During his service in the C. N. G. he was looked upon as a most able officer and a good disciplinarian. When Governor Coffin came into office in 1895 he appointed Dr. Graham adjutant-general on his staff. This appointment came unsolicited.

In July 1893 he was appointed one of the original board of Dental Commissioners of Connecticut, and was elected president of the board, which office he held until July 1900. He was one of twenty-nine signers of the constitution of the Connecticut State Dental Association when it was organized in 1864, and served as president during 1895.

General Graham had not been well for eight years. In 1896, while on duty at the state military encampment, he suffered a partial sunstroke. This, together with the

loss of a daughter in the terrible Park Central Hotel explosion and a series of unfortunate annoyances, brought on a nervous collapse some few months ago.

Dr. Graham was a prominent member of the Universalist church at Middletown, and served upon the finance committee for many years. He was a quiet, retiring, kindly man of excellent judgment, and only those who knew him intimately could appreciate his sterling value. He seldom entered into discussions or offered opinions, but when he did his views were sound, concise, reliable, and convincing.

He is survived by a wife, brother, three sisters, and a daughter.

G. L. P.

DR. SAMUEL JOHNSTONE COCKERILLE.

DIED, near Washington, D. C., September 9, 1902, SAMUEL JOHNSTONE COCKERILLE, D.D.S.

Dr. Cockerille was born on his father's farm, Willowdale, now the village of Herndon, Fairfax county, Va., September 23, 1830. Dr. Cockerille obtained his first education at Dranesville, three miles from his home. In 1848 he matriculated at Washington College, Washington, Pa., where he remained for a short time. From 1850 to 1851 he taught school in London, and in the fall of 1851 he entered the Baltimore College of Dental Surgery, from which he was graduated in April 1853. He took no other course in dentistry, but was for a short time in partnership with Dr. Wadsworth of Washington, D. C. He

then opened an office in that city, where he practiced up to the time of his death. He took part in the Civil War as a guide to General Lee's army through Maryland, but never saw active service, owing to the delicate state of his health, which precluded his accepting a position in the army. Immediately after the close of the war he returned and resumed the practice of his profession.

Dr. Cockerille was a member of the Southern Dental Association and was frequently a contributor to that and other societies. In April 1888 he was appointed to the professorship of operative dentistry in the National University at Washington. The condition of his health became aggravated several years ago owing to the death of two of his sons from diphtheria; the shock of these irreparable losses caused almost intolerable anguish to Dr. Cockerille and left upon him indelible marks of grief. His health never improved, although he kept up the practice of his specialty, particularly in view of the desire of his friends to be treated by him—in whom they recognized the conscientious, reliable, and painstaking practitioner. Dr. Cockerille was a skilled operator, working constantly and indefatigably for the welfare of those whose troubles he undertook to alleviate by his professional services. A few of his surviving patients point today with pride to fillings which although inserted forty-five years ago are now as perfect as ever.

In 1857 he married Miss H. R. Dufour, daughter of the Hon. — Dufour of Indiana. Of this marriage sixteen children were born, ten of whom survive him, together with his widow.

SOCIETY NOTES AND ANNOUNCEMENTS.

SOUTHERN BRANCH OF THE NATIONAL DENTAL ASSOCIATION.

THE eighth annual meeting of the Southern Branch of the National Dental Association will be held February 21-23, 1905, at Memphis, Tenn.

J. A. GORMAN, *Cor. Sec'y*,
Asheville, N. C.

INSTITUTE OF DENTAL PEDAGOGICS.

THE Institute of Dental Pedagogics will hold its annual meeting at Louisville, Ky., December 28, 29, and 30, 1904.

This has come to be the most important dental gathering of the year, and no teacher or practitioner interested in dental education can afford to miss the session.

H. B. TILESTON, *Pres.*,
W. E. WILLMOTT, *Sec'y*.

UNION MEETING IN BASEL, SWITZERLAND.

A UNION meeting will be held in Basel, Switzerland, December 17, 18, and 19, 1904, of the European Advisory Boards Association to the National Association of Dental Faculties, the S. W. Section of the Centralverein in Amerika graduirter Doctoren der Zahnheilkunde (E. V.), the Swiss Association of American Dentists, and the Zahnärztliche Gesellschaft in Basel, to which members of the American Dental Society of Europe, the International Dental Federation, the Swiss Odontological Society, the Dental Club of Paris, and other societies will contribute. Programs may be secured on and after November 15th from the president, Dr. L. C. Bryan, or the secretary, Dr. H. B. Respinge, Basel, Switzerland, to whom notices of intended participation in the meetings should be addressed. A special feature will be made of table clinics and exhibits of all articles and novelties of interest to dentists. These will be gladly received and given ample accommodations in

the public buildings of Basel, which have been secured for the meeting. All dentists in affiliation with recognized dental societies are cordially invited to attend.

Communications regarding hotel accommodations should be addressed to Dr. Ferdinand P. H. Facklam; clinics and demonstrations to Dr. V. De Trey; exhibits to Dr. Ferdinand Kloetzer; papers to Dr. F. T. Schaer; invitations to Dr. E. Grossheinz—all of Basel.

L. C. BRYAN, *President*,
H. B. RESPINGER, *Sec'y*.

FIRST DISTRICT (N. Y.) DEN- TAL SOCIETY.

ANNIVERSARY MEETING.

THE First District Dental Society will celebrate its thirty-sixth anniversary with two great meetings on the 12th and 13th of December. The essayists of these meetings will be Dr. G. V. Black of Chicago and Dr. E. K. Wedelstaedt of St. Paul. Dr. Black will read an exhaustive resume on the subject of "Extension for Prevention," illustrating his lecture with 125 or more lantern-slide pictures. Dr. R. H. Hofheinz will open the discussion. On December 13th Dr. E. K. Wedelstaedt will read a paper on the "Packing of Gold in Approximo-Occlusal Cavities in Bicusps and Molars," illustrating his method with the use of clay in large wooden models of teeth. The discussion of this paper will be opened by Dr. G. V. Black, followed by Dr. R. Ottolengui and Dr. B. Holly Smith. These meetings will be held at the New York Academy of Medicine, No. 17 West Forty-third st., at 8 P.M.

In addition to these meetings the Clinic Committee has arranged for a most interesting clinical exhibition to be held during the afternoons of these days, at the Grand Central Palace, Lexington ave. and Forty-third st. This program comprises porcelain work, X ray, different methods of packing gold, orthodontia, exhibits of different anatomical

and histological specimens, etc. Dr. Black will exhibit new instruments for testing the finger power in the handling of operative instruments. Every facility will be afforded to enable the largest number to witness the demonstrations. The entire mornings of both days will be devoted to manufacturers' exhibits, which will be an interesting feature of the program. All communications pertaining to clinics or exhibits should be addressed to the chairman of the Clinic Committee, Dr. S. L. Goldsmith, No. 129 East Sixtieth st.

The following dental societies have been officially invited: New York Institute of Stomatology, New York Odontological Society, New York Institute of Dental Technique, Second District Dental Society of the State of New York, Central Dental Association of Northern New Jersey, Hartford Dental Society, and New Haven Dental Society, and a cordial invitation is also extended to all members of the dental profession.

F. L. FOSSUME, *Chairman*,

A. M. MERRITT,

A. G. LANSING,

Executive Committee.

NEW YORK ODONTOLOGICAL SOCIETY.

THE thirty-eighth anniversary meeting of the New York Odontological Society will be held Tuesday, January 17, 1905, at the New York Academy of Medicine, No. 17 West Forty-third st. The afternoon will be devoted to an interesting series of clinics, which will be given from two to five o'clock.

An important paper on "Porcelain" will be presented at the evening meeting, which will be followed by a collation.

W. D. TRACY, *Cor. Sec'y.*

NEW YORK COLLEGE OF DENTISTRY.

REUNION—CLASS OF '91.

THE annual reunion of the class of '91, New York College of Dentistry, will be held in New York city, January 14, 1905. Members of the classes of '90 and '91 are cordially invited to participate.

Further information may be obtained from

W. H. McCUTCHEON,
487 Clinton ave., Brooklyn, N. Y.

OHIO STATE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Ohio State Dental Society will be held at the Great Southern Hotel, Columbus, Ohio, December 6, 7, and 8, 1904.

S. D. RUGGLES, *Sec'y*, Portsmouth, Ohio.

SOUTHEASTERN IOWA DENTAL SOCIETY.

THE second annual meeting of the Southeastern Iowa Dental Society will be held in Burlington, Iowa, January 9 and 10, 1905.

WM. M. TERRY, *Sec'y*,
Washington, Iowa.

CALIFORNIA BOARD OF DENTAL EXAMINERS.

THE California Board of Dental Examiners will hold an examination in San Francisco, commencing on Thursday, December 15, 1904.

F. G. BAIRD, *Sec'y*.

INDIANA BOARD OF DENTAL EXAMINERS.

THE Indiana Dental Board will hold its next regular meeting at the county courthouse in Ft. Wayne, Ind., on January 10, 1905.

The examination will begin at 9.30 A.M. on that day. Applications should be filed with the secretary by January 5th.

D. L. STINE, *Sec'y*,
440 Newton Claypool Bldg., Indianapolis, Ind.

COLORADO BOARD OF DENTAL EXAMINERS.

THE regular semi-annual meeting of the Colorado State Board of Dental Examiners will be held in Denver, December 6, 7, and 8, 1904.

The examination will be both theoretical and practical, and applicants for the examination must be prepared to do such practical work as is required.

All applications must be filed before December 6.

M. S. FRASER, *Sec'y*,
407 Mack Block, Denver, Colo.

ARMY DENTAL CORPS.

CONTRACT Dental Surg. Hugo C. Rietz, now at Fort Sheridan, Ill., will proceed to Fort Brady, Mich., for duty for one month, and then return to Fort Sheridan. (Oct. 14, D. Lakes.)

The tour of duty at Fort Monroe, Va., of Contract Dental Surg. Douglas E. Foster is extended to include December 10, 1904. (Oct. 27, D. E.)

Contract Dental Surg. Jean C. Whinnery will upon the expiration of his present leave proceed to Vancouver Barracks, Wash., for duty. (Oct. 29, W. D.)

Contract Dental Surg. Franklin F. Wing will proceed to Fort Des Moines, Iowa, for temporary duty to finish the uncompleted work begun by Contract Dental Surgeon Tignor. (Oct. 20, D. Mo.)

Contract Dental Surg. George E. Stallman will proceed to Camp Stotsenburg, Pampanga, for duty. (Sept. 9, D. Luzon.)

Contract Dental Surg. Ord M. Sorber will proceed to the Philippine Islands on the army transport scheduled to sail November 1st, for duty. (Oct. 24, D. Cal.)

Contract Dental Surg. George L. Mason is granted leave for one month, to take effect about November 8, 1904, with permission to apply for an extension of twenty-three days. (Oct. 25, D. G.)

Contract Dental Surg. Edwin P. Tignor will proceed to the Philippine Islands on the

transport "Sherman," to sail November 1st. (Oct. 28, D. Cal.)

Contract Dental Surg. John A. McAlister is assigned to duty in charge of dental base station No. 3, Zamboanga. (Sept. 12, D. Min.)

Contract Dental Surg. Julien R. Bernheim will proceed to Camp Daraga, Albay, for duty. (Sept. 22, D. Luzon.)

The following named dental surgeons are relieved from their present stations and will proceed to and take station at the posts designated: Dental Surg. S. D. Boak, Fort Myer, Va.; Dental Surg. Douglas E. Foster, Fort Slocum, N. Y. (Nov. 14, W. D.)

The leave granted Dental Surg. Jean C. Whinnery is extended one month. (Nov. 15, W. D.)

**DISTRICT OF COLUMBIA
BOARD OF DENTAL
EXAMINERS.**

THE semi-annual examination of the Board of Dental Examiners of the District of Columbia will be held January 4, 5, and 6, 1905, at the Dental Department of the Georgetown University, 920 H street, N. W., Washington, D. C.

All applications for examination must be accompanied by a fee of ten dollars, and should be filed with

WM. E. DIEFFENDERFER, *Sec'y*,
Colorado Bldg., Washington, D. C.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING OCTOBER 1904.

October 4.

No. 771,575, to CHARLES H. RICHARDSON. Extensible bracket.

October 11.

No. 771,961, to WM. B. ALFORD and EDWIN P. ALFORD. Support for dental engines and spittoons.

No. 772,104, to GEORGE C. KUSEL. Artificial tooth.

No. 772,304, to FRANK L. WILLIAMS. Dental articulator.

No. 772,324, to NELSON D. ASDELL. Root-extracting forceps.

October 18.

No. 772,907, to HERMAN E. REYNOLDS. Dental draw-press.

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After Samples of S. H. GUILFORD, A.M., D.D.S.

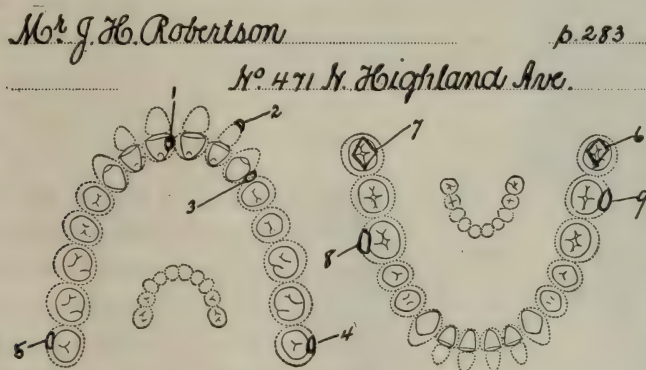
The Card Index is peculiarly well adapted to the keeping of the accounts of dentists with their patients, as a brief study of the system here exploited will show.

It is a simple method; readily comprehended, easily kept.

It saves the labor of opening a new set of books every year or two, is practically continuous.

There is never any trouble about finding space to open new accounts.

RECORD CARD



SUGGESTED BY S. H. GUILFORD, A. M., D. D. S.

[illegible]

THE S. S. WHITE DENTAL MFG. CO.

Z-47

REDUCED ILLUSTRATION OF RECORD CARD SHOWING TRANSACTIONS

Each account has a card to itself, can be taken out at any time or restored after being taken out, without disturbing the "balancing of the books" in either instance.

Only live accounts are in evidence, and it takes but a moment to find the state of any one of them. Dead accounts, such as of patients who have died or removed, are destroyed or thrown away. As a matter of fact, the system saves a good deal of labor.

The outfit comprises examination blanks, two kinds of cards for accounts, and three sets of guides to the account cards. For prices see page 3.

For prices see page 3.

CASH OR BILL CARDS

Bills

1901			REC'D	PAID
Jan	1	Albert J. J.	29	
"	1	Archer H. J.	18 50	
"	1	Berzelius John O.	63	
"	1	Barker O. R.	39	
"	1	Benson Miss H.	22 50	
"	1	Blayton Mrs. R.	74 50	
"	1	Johnson G. E.	112	
"	1	Davidson L. H.	33	
"	1	Orlues C. J.	41	
"	1	Franklin H. H.	89 50	

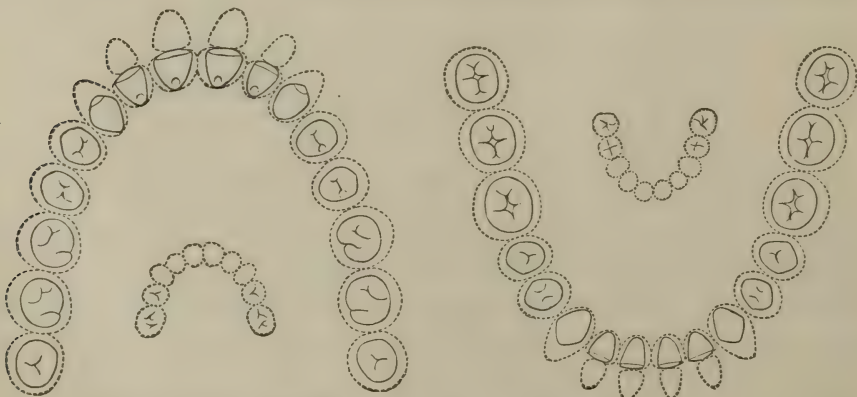
Cash

1901			REC'D	PAID
Jan	3	Archer H. J.	18 50	
"	"	Davidson L. H.	33	
"	"	Barker O. R.	39	
"	"	Franklin H. H.	89 50	
"	"	Benson H.	22 50	
"	5	Blayton R.	74 50	
"	"	Albert J. J.	29	
"	"	Cunningham A. B.	49	
"	"	Barker O. R.	63	
"	6	DuPont V. E.	92	

The cards are known respectively as "record cards" and "cash or bill cards." The "record cards" (white) correspond to what in an ordinary set of books would be a ledger account. The use of the "Cash or Bill Cards" (which are blue in color) is indicated by their name,—one form answering for both purposes.

The guides tell at a glance the condition of any live account. They are of three colors,—buff, salmon, and blue,—a full alphabetical index of each,—which are used in this way: The buff for accounts of patients for whom work is in progress, the salmon for those whose work has been completed but not paid for, and the blue for those which have been settled.

EXAMINATION BLANK No. 4



SUGGESTED BY S. H. GUILFORD, A. M., D. D. S.

The System is used as follows :

The Examination Blank is the basis of the work to be done from which the charges are to be made.

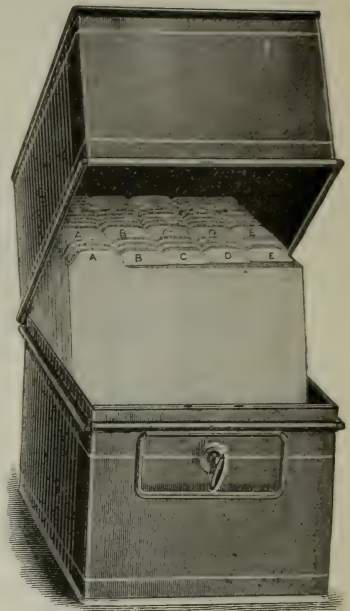
When the first work is done—if charge is made for the examination, *that* is the “first work done”—a “Record Card” is inscribed with the name of the patient and the proper charge entered upon it.

The card is then placed in its proper alphabetical position among the Buff Guides. After each appointment, the charges are entered upon the “Record.” When all the work indicated by the Examination is completed, the Record is placed among the Salmon Guides. The dentist thus knows that only those accounts found in the Salmon Guides are to be billed or collected. As the bills are sent out the amount of each is entered on a “Bill Card.” As cash is received, it is entered on a “Cash Card,” the entry on the “Bill Card” erased, and the “Record” placed among the Blue Guides, to remain there until the patient comes again for another examination.

Each “Record Card” represents a separate account. On a “Cash or Bill Card” each line represents an account.

We give examples showing the use of each of the cards; also, the style of the Examination Blank, which is known as our No. 4.

A complete outfit consists of 100 Examination Blanks, 300 White Record Cards, 15 Cash or Bill Cards, with the three sets of Guides. Cards and Guides are of Bristol Board, 5 x 7 inches. The whole is sold in a japanned tin case with lock and key.



Actual size of Tin Case Outfit
5 in. wide, 8½ in. long, 7½ in. high

Price, Outfit Complete	\$5.00
Extra Cards, Guides, and Examination Blanks can be bought at any time.	
Price, Record Cards	per hundred .75
“ Cash or Bill Cards, package of 25.....	.25
“ Guides, either color	per set .50
“ “ three sets (one of each color).....	1.50
“ Examination Blank No. 4, per pad of one hundred .....	.20

THE S. S. WHITE COPPER AMALGAM

Our Copper Amalgam is antiseptic and non-shrinkable, and prevents the recurrence of decay. It is very plastic, easily manipulated, and slow-setting, so that all the necessary time may be taken. It is non-irritating, can therefore be placed in close proximity to the pulp, and it is so easily manipulated that in such event it can be placed without undue pressure upon the pulp. A filling is quickly and easily finished. For these reasons, it is regarded by many as the best filling for children's teeth in positions where its discoloration is not noticeable.

For practically the same reasons, and because also in many instances it seems to have a distinct preservative effect upon them, it is highly regarded in the filling of adult molars of “soft,” chalky structure.

Our Copper Amalgam is, just as it always has been, fully equal to any, and superior to most of its class.

Put up in 1-ounce boxes.

PRICES

Ounce	\$1.00	|	5 ounces	\$4.00
-------------	--------	--	----------------	--------

The Warren Improved Dental Ledger No. 2



Mr. John Doe
1769 Casey St.
Recommended by Mr. Richard Roe.

No.	1895	Feb. 20	" 2	" 21	" 3	" 4	" 5	" 23	March 3	Dr.	Cr.	MEMORANDA.
		✓	✓							7.50		
										5.00		
										2.50		Pulp capped with Asbestos
										2.50		
										2.50		
										20.00		Richmond Crown - two pins.
										40.00		
										340.00		

Diagram about two-thirds actual size

This is an extremely attractive book so far as external appearance goes, an impression which is strengthened by an examination of the plan on which it is laid out, and confirmed positively and finally by actual use.

It is nearly square, 11½ x 10½ inches, opens flat, and contains two sizes of accounts, one size occupying an entire page, the other a half page.

A glance at the reduced reproduction of one of the small accounts will give an idea of how simple is the method of keeping accounts in this form. You simply fill in the date, put a check in the appropriate column, and enter the amount in the debit column. Each operation is of course numbered upon the diagram, the entries being correspondingly numbered for identification. The diagrams are printed in red, so that the numbers made in black ink are readily seen.

The method is quick, complete, and convenient, as well as simple.

The No. 2 Warren Ledger, 312 pages,—152 with a single account to the page, 160 with two to the page.

Half bound, American Russia, wine-colored cloth sides, red edges, ample index.

Price\$2.50

NERVE PASTE

A proper combination of arsenous acid and creasote that has proved to be a standard application to pulps when they are condemned to devitalization. Does its work promptly and with the least pain.

Priceper bottle \$0.50

ALLPORT'S

Improved

Registering Dental Ledger

That the Allport Ledger, after forty odd years, is still probably more extensively used than any other dentists' account book is very good evidence of the vitality of the idea underlying it,—a diagram to indicate the location of the operation, a symbol to describe its character. The diagram and symbols cover the needs of any form of practice, and afford a simple, easily kept, accurate record.

Two accounts to the page, each with diagram as shown, with place for name, reference, date of operation, charges, and credit for amounts paid.

Good paper, substantially bound, with ample index. In stock regularly as priced below.

PRICES

340	pages,	Half Turkey,	Cloth Sides	\$3.50
340	"	"	Roan, Paper	3.00
172	"	"	"	2.00

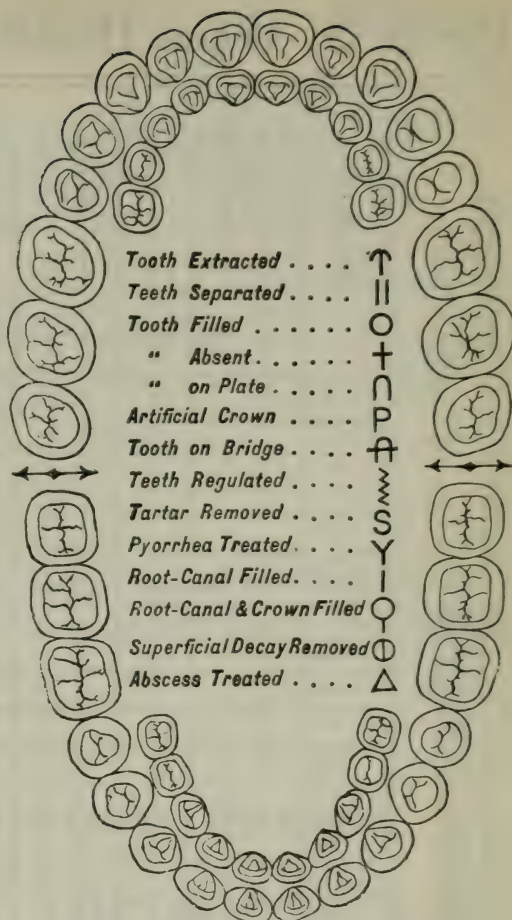


Diagram and Symbols

SUMP

A Time-Saver in Investments

Sump as an investment material is unexcelled in its practical working qualities. It makes a good model, it holds together firmly, it does not crack, it can be built onto with the assurance that the built-up portion will not separate in the firing, it holds the teeth securely and protects them, and it is readily removed from the model after the soldering is completed.

Sump mixes quickly, because it requires little water, and dries out quickly, because it gives up the water easily. An investment of it can be put into the oven or under the blow-pipe almost as soon as completed, so that the soldering can go on promptly. It thus facilitates rapid work and saves valuable time.

Sump is a powder of pale lilac color, which becomes deeper when it is mixed.

Sold in one-quart cans (2½ lbs.) and in bulk.

PRICES

Per can	.....	\$0.75
Bulk (10 lbs. or over) per lb.	.....	.25

The S. S. White Dental Appointment Book No. 3



SATURDAY

APPOINTMENTS.

NAME	Hour.	No.	Gold Filling.	Amalgam Filling.	Phos. Zinc Filling.	Gutta Percha Filling.	Tin Filling.	Artificial Crowns	Bridges.	Treatment.	Cleaning Teeth.	Extraction.	Artificial Dentures.	Reserved Time	Dr	Cr	MEMORANDA.
	8																
	9																
	10																
	11																
	12																
	1																
	2																
	3																
	4																
	5																

An appointment Book with the unequalled Allan diagram, more especially for those who use the Warren Dental Ledger.

The book is oblong; the pages, of which there are 312, are 5 1/4 x 9 inches. The diagram is printed in red (natural size), so that marks upon it will be more readily seen. Below the diagram are the spaces for appointments from 8 A.M. to 5 P.M., with headings for all the usual operations, and memorandum space for any special notes. The reduced reproduction of a page herewith gives a clear idea of the advantages of this book.

Printed on good paper, paged and indexed, bound in cloth, with leather back; red edges.

Price\$1.25

SPUNK

With Spunk, as with other things dental, there is a great difference in the quality of the goods that may be offered to you. By carefully watching the market we have been able to import the finest quality of Spunk that has ever been offered to the profession. It has that fine velvety feeling that is so essential to good quality.

PRICES

As it runsper oz. \$0.20; per lb. \$2.25
Selected " oz. .50

The Diagram Appointment Book

The feature of this Appointment Book is the facility which it affords for making a brief but clear memorandum of the work to be done for each patient at the time the appointment is made.

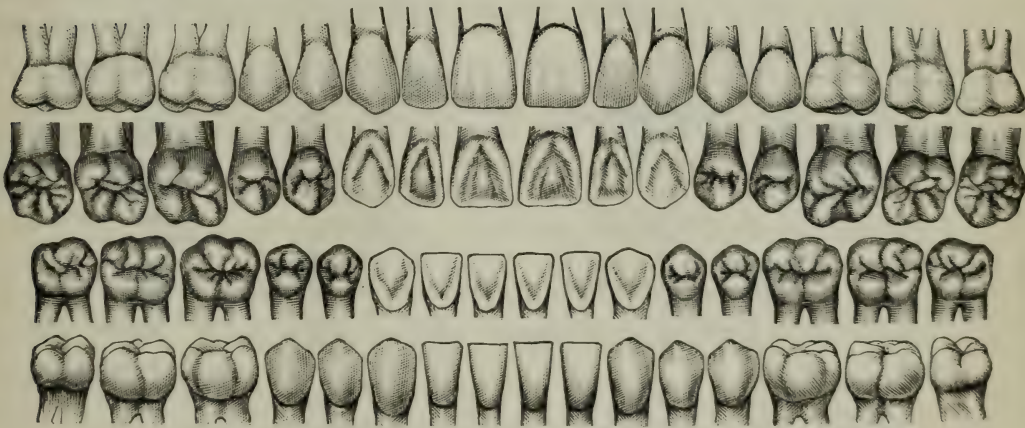
For each day there is a diagram of the teeth. As appointments are made, the hour set apart is noted upon the diagram, opposite the tooth or teeth to be treated. When the patient takes his place in the chair, a glance at the diagram shows the operator at once where the work is to begin.

The illustration shows a typical day's markings.

The book is 6 $\frac{3}{4}$ x 4 $\frac{1}{4}$ inches. In the front are calendars for three years, and a table showing the number of days from any day in one month to the same day in any other month; following this are the appointment pages, a full week's appointments being shown when the book is opened. Back of this are pages for memoranda and blanks for monthly cash account and yearly summary. Supplied in cloth or leather.

Price, Cloth	\$0.30
“ Leather .....	.50

Allan's Examination Record



If you want to keep the Record of your Examination where you can refer to it in a moment, you will use the Examination Record as devised by Dr. Chas. F. Allan. In this Record the diagram shown above is printed on leaves (one side only). At the bottom of each leaf are blanks for the name of patient and date of examination, the space intervening being used for such memoranda as may be required. The leaves are bound in oblong books containing 100 each, on the front cover of which is the imprint "Examinations. From.....to....."

Keeping these accessible, the dentist has only to refer to his ledger to get the date of any examination made; then turn to the "Examinations," and it is but a moment's search to find the one wanted. The diagram is the most complete in its exposition of the various surfaces of the teeth that has yet been brought forward.

We have also the books with the leaves numbered, and four ruled pages for indexing.

The book contains 100 leaves $5\frac{3}{4} \times 7\frac{1}{2}$ inches, with the diagram on each leaf.

Price, per book of 100 Diagrams, 5 $\frac{3}{4}$ x 7 $\frac{1}{2}$ inches	\$0.30
“ “ “ “ “ “ “ Indexed and Paged .....	.40

Dentists' Pocket Diary and Appointment Book

FOR

Registering Appointments for Dental Operations

MONDAY			19
8		1	
9		2	
10		3	
11		4	
12		5	

TUESDAY			19
8		1	
9		2	
10		3	
11		4	
12		5	

WEDNESDAY			19
8		1	
9		2	
10		3	
11		4	
12		5	

The Diagram shows the exact size and style of a page of the Pocket Diary and Appointment Book, presenting, when open, engagements for one week. The figures denote the hour of the engagement. It contains blanks for 54 weeks, and, being without date, is good for any time. It has also a neat Memorandum attached. One of the oldest and most popular forms.

Price, Flexible

Cover, Gilt

Edge\$0.55

Price, Flexible

Cover, Gilt

Edge, with

Pocket and

Tuck80

WAX CEMENT

Wax Cement is unexcelled for the temporary attaching of crowns and clasps or bridge-work for soldering. It is strong and sets quickly, holding the parts firmly for trial in the mouth, and during the subsequent investment. It is hard and brittle when set, breaking with a sharp fracture, and because of this quality is readily removed, coming away cleanly. As found in the box, it is so hard that it must be taken out and applied with a hot spatula.

Put up in enameled metal boxes, 3 inches diameter by 1½ inches depth.

Price per box \$0.25

An Old Story

IF it is good will bear being told over and over again. The story of the **World's Premium SS Porcelain Teeth** is good, and it has the additional merit of being true.

They have for long been looked up to as affording a nearer approach in appearance to the natural teeth—in the mouth—than any other make of artificial teeth.

They are stone, which is devoid of life, yet they look like bone, which is life itself.


Take the various makes and place them one by one alongside of the natural teeth in the mouth, and you will be convinced that our product comes nearest to the natural organs in shape, color, and texture.

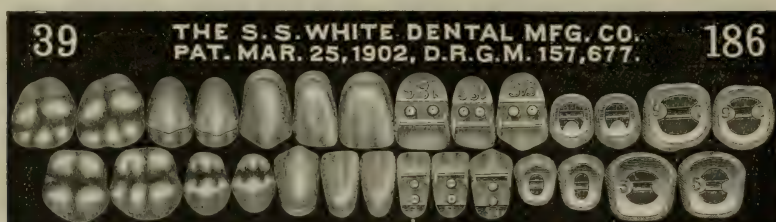
You can easily satisfy yourself on this point.

Our Catalog of Porcelain Teeth will be a real help to any prosthetic dentist.

THE S. S. WHITE DENTAL MFG. CO.

Seeing is Believing


If you could dissect an artificial denture made of an  "Combination" Set, you would see the practical value of these teeth, and would never again question it.



"Combination" Set of 28s, Uppers and Lower. Showing the blend of pinless and pin teeth and the means of attachment to the vulcanite


The four pictures herewith give an inkling of the results of such a dissection.

The first shows a full "Combination" Set of 28s, uppers and lowers, on a wax card, one half reversed to show the means of attachment—fronts with pins, backs with undercut recesses.

The other three demonstrate the elegance of appearance and the superiority of the hold of  pinless (Diatoric) teeth upon the vulcanite.

Printers' ink has its limitations, however, and these pictures, much as they show, fail to convey an adequate idea of the great value of these teeth.

They are strictly high grade, and their price is moderate.

If you are interested in this combination,—high-grade product with moderate price,—give these  "Combination" Sets a trial. They will not fail you.

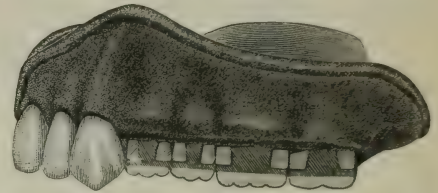


"Combination" Sets

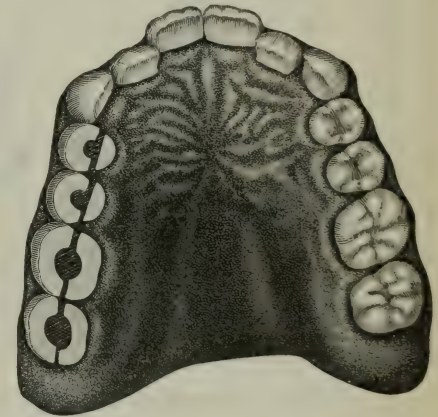
T H E B L E N D
— IN THE —
COMPLETED DENTURE



T H E C L I N C H I N G
— OF THE —
V U L C A N I T E
in the M O L A R S *and*
B I C U S P I D S



T H E V U L C A N I T E
in the M O L A R S *and*
B I C U S P I D S
I S C O N T I N U O U S
— WITH THE —
V U L C A N I T E
of the B A S E - P L A T E



Porcelain and Vulcanite are so dovetailed into each other that they cannot be separated, short of smashing

PRICES

	Each	\$25.00 Lots	\$50.00 Lots	\$100.00 Lots	\$300.00 Lots
Diatomic Molars and Bicuspids	\$0.06	\$0.05½	\$0.05	\$0.04½	\$0.04
"Combination" Sets, 14's.....	1.38	1.31	1.24	1.14	1.04
" " 28's	2.76	2.62	2.48	2.28	2.08

Save by Buying at Quantity Rates and Paying Cash

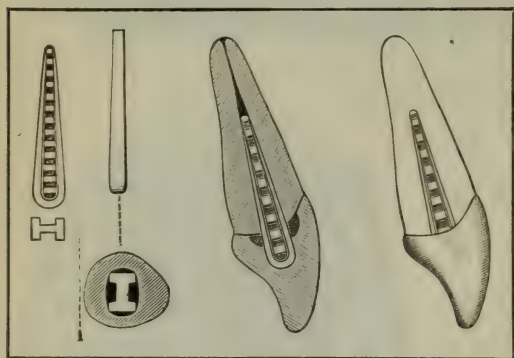
	Retail Price	Quantity Price	Quantity Price less cash discount	Net Per Set	Money Saving on Retail Price	Percentage of Saving
20 Sets 14's.....	\$27.60	\$26.20	\$24.89	\$1.244	\$2.71	9.8 per cent.
41 " 14's.....	56.58	50.84	48.30	1.178	8.28	14.63 "
88 " 14's.....	121.44	100.32	90.29	1.026	31.15	25.65 "
289 " 14's.....	398.82	300.56	270.50	.936	128.32	32.17 "

THE ANCHOR POST

is not the least important item in the crowning of a natural root. On the contrary, it is one of the prime factors. Both crown and root are attached to it, and upon its shape and placing the proper position of the crown and the permanence of the operation largely depend.

Its form, therefore, is of the highest moment. If incorrect in shape, the operation will fail because the crown will become loosened from the root.

The Logan Post is the ideal form. It is of a regular I-beam shape in section, largest at the crown end, whence it tapers to the root end. A flange extends along the edges, the body of the metal between being corrugated.



Placing its greater breadth labio-lingually across the root, we thus have the greatest body of the metal where the greatest strength is required and so disposed as to best resist the force of mastication.

The reaming of the root to receive it, because of the general correspondence in shape, weakens the root comparatively little. The correspondence in shape, with the flanged edges, prevents all tendency to rotate. The corrugations and the flanges afford an unequaled hold for the cement.

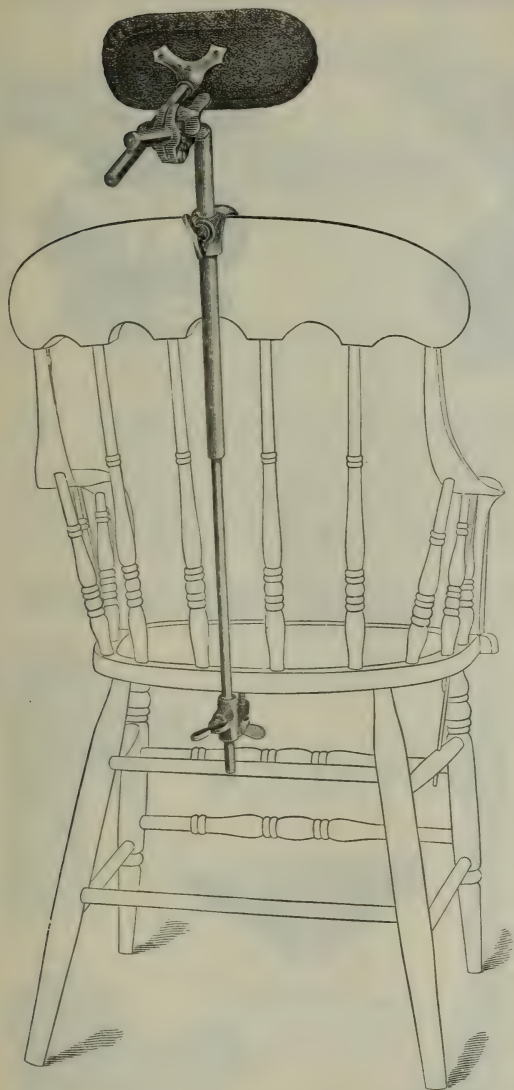
Its anchoring post is one of the prominent features in the popularity of the Logan Crown.

CATALOG OF PORCELAIN TEETH FREE FOR THE ASKING

PORTABLE HEAD-RESTS

THE S. S. WHITE

(Improved)



May be attached to almost any chair.
Free and full movement in all directions.
Up-and-down range, 8 inches.
Suits a tall man or a small child.
Holds its place without movement.
Affords firm support.

Substantially made, nicely finished—all exterior metal parts nickel-plated; upholstered in green or maroon plush.

Weights $5\frac{1}{2}$ lbs.; packs in box $16\frac{1}{2} \times 9\frac{1}{2} \times 4\frac{1}{2}$ inches; box fitted for repacking.

Price\$12.00

DR. O. C. WHITE'S

Improved Self-Attaching

Styles No. 6 and 7 Light Weight



The illustration shows these Head-RESTS attached to a common office chair, and compactly folded for transportation or to lay aside. More than 10,000 of them have been sold. Their construction has been carefully revised and brought up to date in every particular. Special improvements have been made in the jointing and in the shape of the cross-arm, which give even greater strength, rigidity, and adjustability.

These Head-RESTS accommodate themselves to almost any style of chair, sofa, lounge, or settee, and can be used on the backs of car-seats when traveling. They have free adjustability to any positions—either of a tall person or of a child—and are securely fastened by turning but *one* thumb screw. They are equally well adapted for the office, house, or for travel, and are an invaluable comfort to the sick.

Bars and slides of malleable and wrought iron, finely japanned.

Thumb screw and top piece nickel-plated. Base plate in gilt.

Weight $4\frac{3}{4}$ lbs.

Price, No. 6, Upholstered in Plush.....\$8.00
" No. 7, Upholstered in Raw Silk... 7.00

Style No. 9, Large Size

This Head-REST is made heavier and stronger throughout than Nos. 6 and 7. The Pad is larger and is removably attached to its supporting arm by a Ball-and-Socket-Joint. It has had the same improvements and reconstruction as the lighter styles. It folds up to occupy but little space, has a great range of adjustability, and is a device of the highest grade in every respect.

Metal parts of steel, wrought and malleable iron, finely japanned.

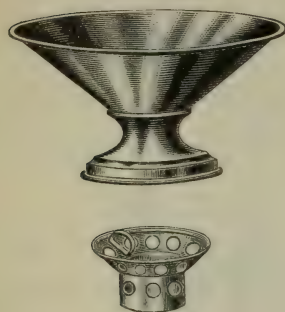
Thumb Screws and Ball-and-Socket-Joint nickel-plated. Base Plate in gilt.

Weight, complete, $7\frac{1}{4}$ lbs.

Price, Style No. 9, Upholstered in
Plush\$13.00
Price, Style No. 9, Upholstered in
Raw Silk 11.00

CUSPIDORS

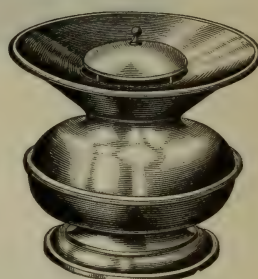
No. 4 in parts



No. 4



No. 6



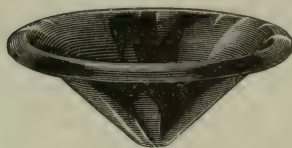
These two Cuspidors are strong and durable and readily cleansed. Made of heavy spun brass, nickel-plated.

No. 4 is especially heavy and durable. It has a gold-catcher, as shown which is suspended from a shoulder at the junction of funnel and bowl. The opening between the funnel and bowl is small. For easy cleansing, the upper section unscrews. Dimensions, $7\frac{1}{2}$ inches high, $7\frac{3}{4}$ inches across the greatest diameter of the funnel.

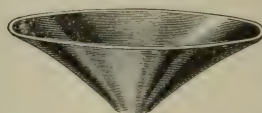
No. 6 has a large opening from the funnel into the bowl, is without gold-catcher, but is supplied with a cap to hide the contents of the bowl. The large opening permits it to be conveniently cleaned.

Price, Cuspidor No. 4, including Gold-Catcher.....	\$4.00
“ “ “ 6	2.50

CUSPIDOR FUNNELS



Glass Funnel for No. 2
Cuspidor



Glass Funnel for
Nos. 4 and 6 Cuspidors

A glass Funnel will save the plating of a metal cuspidor from injury from mercury, acids, etc. These of ours are made of claret-colored glass.

Price, Glass Funnels for Nos. 2, 4, and 6 Cuspidors	each \$0.75
“ “ “ 9 to 12 inches, for Old Style Standard Spittoons,	per lb. .50

HAND CUSPIDOR

Suggested by DR. ISAAC DOUGLASS



The size of this Cuspidor makes it convenient during extraction under nitrous oxid or other operations under anesthetics, as it can be held close under the chin of the patient. Size, 2 inches deep, 6 inches in diameter.

Sold with handle (as shown) and without.

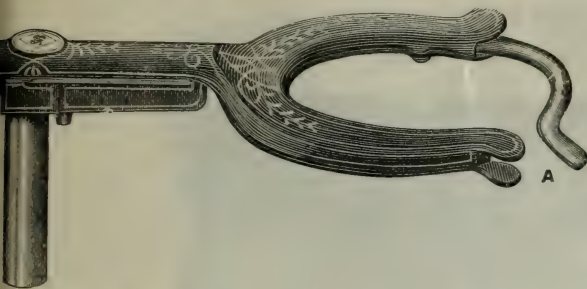
Price, without Handle.....	\$2.00
“ with “	2.50

CUSPIDOR BRACKET

No. 4

Perfection Polishing Strips

This Cuspidor Bracket is a model of convenience and security. It has no spring, catch, or lock; a slight push on the point of the arm at A opens or closes it, yet there is no possibility of accidental



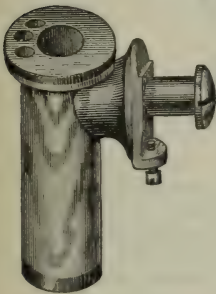
opening. It is made in our usual style, japanned and neatly ornamented.

Price, without Socket\$2.50

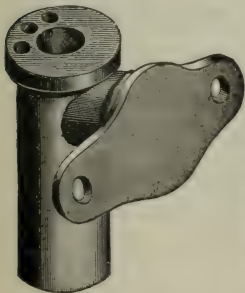
These Brackets are made with sides so beveled as to take any of our cuspidors, and are adapted to Sockets Nos. 1, 2, and 3.

SOCKETS

For Cuspidor Brackets



No.1



No. 2



No. 3

- No. 1, for Wilkerson, New Model,
Pedal-Lever, Cycloid, and
Duplex Chairseach \$0.50
- " 2, for Wood-frame Chairs..... " .50
- " 3, " Morrison Chairs " 1.50

These Strips are thin and tough, they can be insinuated into the narrowest interspaces, they have the strength to stand the work; they are charged carefully and skillfully. They are efficient and durable.

EIGHT VARIETIES

Carborundum	Flint	French Emery
Garnet	Lava	Rouge
Emery	Pumice	

The Cutters

Carborundum (see below), Garnet, and Emery are comparatively coarse, or are of a sharper grit. They are in reality cutters for the first cutting down of the excess of fillings, the trimming of margins. They work quickly, but they leave the surface full of scratches.

The Preparatory Finishers

Flint, Lava, Pumice, and French Emery are of a finer grade. Applied after the cutters, they remove the deeper scratches, and leave the dull polish, often called "satin finish," which is preferred by many operators to a high polish. The French Emery gives a fairly high polish. They can also be used for the first dressing down of the excess, but they do not work rapidly.

The Polishers

Rouge is the world's polisher. It gives the high polish, the "burnished gold" effect, leaving the surface like a fine mirror. As before stated, the French Emery Strip approaches this effect and will probably meet the desires of those who want a higher finish than the dull polish, but do not approve of the brilliance imparted by the Rouge.

All our Perfection Strips are cut to 8-inch lengths, and put up in boxes of one gross, separately or in assorted varieties, excepting the Carborundum, which see below.

Priceper box \$0.30

PERFECTION CARBORUNDUM STRIPS

(of our make) are distinctly the best at the service of the dentist when the requirement is cutting. They will cut enamel, will smooth off a sharp edge of tooth-substance quickly; can be used to dress off points of approximal contact between contiguous teeth for the removal of incipient decay. For the first rough finishing of a filling of amalgam or gold, especially when, as sometimes happens, the filling is made too full, they work rapidly.

Three Grits—Coarse, No. 120; Medium, No. 180; Fine, No. 220. Strips eight inches long, in boxes of 1 gross, separate or assorted grits.

Priceper box \$0.30

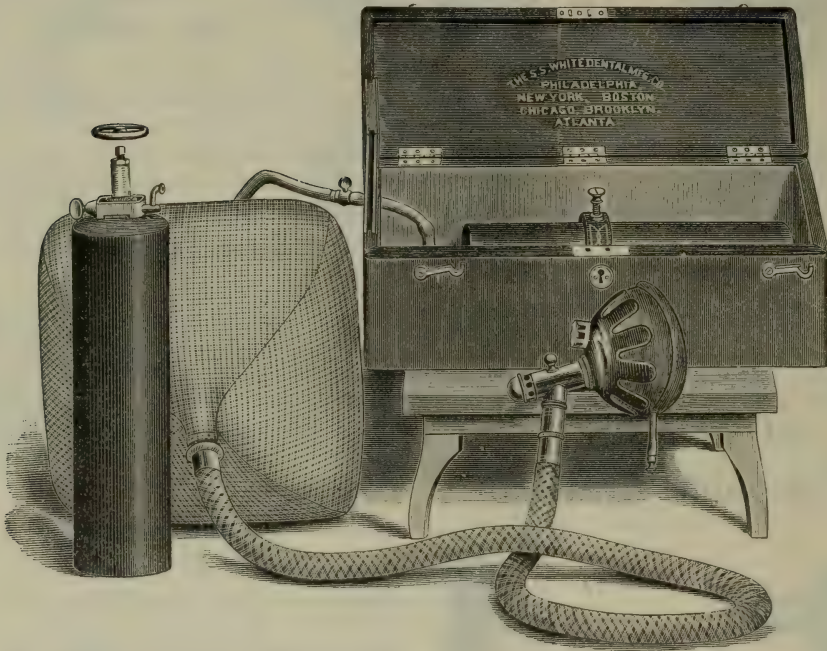
SURGEON'S CASES

Our Surgeon's Case Nitrous Oxide Outfits were devised to permit the convenient administration of the Gas at a distance from the office. There are two forms, Rectangular (Nos. 1 and 2) and Cylindrical (Nos. 5 and 6)

(RECTANGULAR)

Nos. 1 and 2

Patented December 13, 1887; February 14, 1888



Surgeon's Cases Nos. 1 and 2 are alike, except in the size of the gas-bags.

The apparatus consists of an iron cylinder containing at least 100 gallons (usually more) of Nitrous Oxid, liquefied, to which is attached the necessary tubing, with gas-bag and inhaler; the whole inclosed in a stout leather-covered case lined with velvet. The small stop-cock inserted in the tubing between the bag and cylinder enables the operator, after having filled the bag, to shut off the gas and disconnect the bag from the cylinder, if desired for use where it is not convenient to carry the cylinder.

The Case is made of well-seasoned wood, lined with velvet and covered with leather, and the mountings are nickel-plated. A stout cast-steel ring, neatly japanned, with a heavy set-screw, clamps the cylinder. Size 18 x 7 x 7 inches.

For 100-gallon cylinders only. The cylinder lies on its side. The No. 1 Case has a 4½-gallon bag; the No. 2 Case a 7-gallon bag.

These outfits include our No. 3 Inhaler with either the Metal, Flexible Rubber, or Inflatable Rubber Face-piece as desired.

PRICES

No. 1 Case, Complete, with Filled Cylinder	\$31.75
" 2 " " " " "	32.50

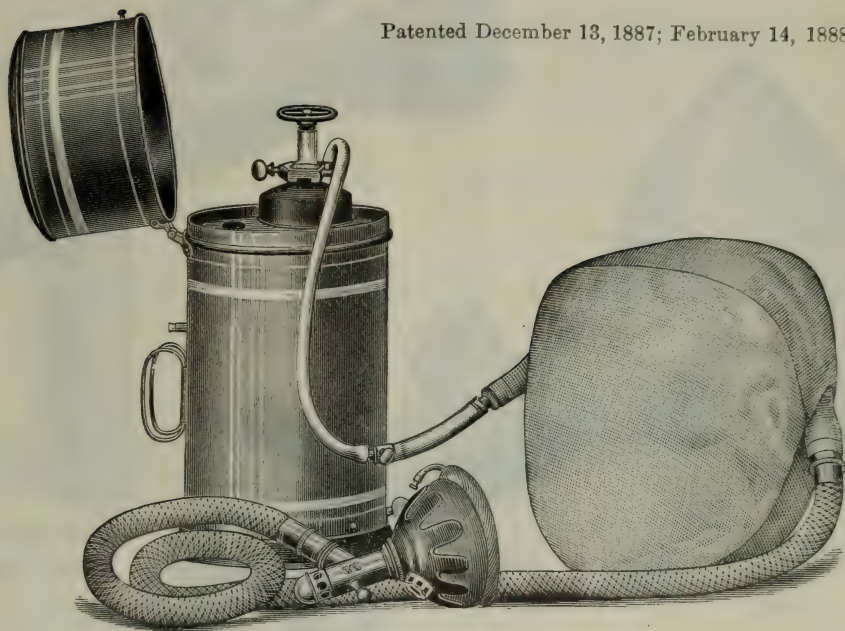
Prices of Various Parts of Gas Outfits

Case, Rectangular Leather-covered, Velvet-lined, Nickel-plated Mountings	\$10.00
" Cylindrical, Japanned, Nickel-plated Mountings	5.00
Gas-bag for Nitrous Oxid, 4½ gallons capacity.....	2.25
" " " " 7 " " " "	3.00
" " Oxygen, 1 gallon capacity	1.00
" " N ₂ O and O Apparatus, 2 gallons capacity	1.50
Stop-cock, for insertion in small Rubber Tubing	1.00
Tubing, Inhaler, Silk-covered	per foot .40

SURGEON'S CASES Nos. 5 and 6

(CYLINDRICAL)

Patented December 13, 1887; February 14, 1888



Surgeon's Cases, Nos. 5 and 6, are alike, except that with No. 5 we furnish a 4½-gallon gas-bag and with No. 6 a 7-gallon bag.

The form is a handsomely japanned metal box, cylindrical in shape, size 16½ x 7 inches, just large enough to contain a 100-gallon cylinder of gas with the gas-bag, inhaler, necessary tubing, etc. The cylinder is securely clamped into a holder which is set in the bottom of the case and supported at the top by a wooden diaphragm through which it passes. The cylinder stands upon its end during the administration of the gas. This is reckoned by some an advantage, as it lessens the liability of the gas to freeze and thus obstruct the passage through the valve.

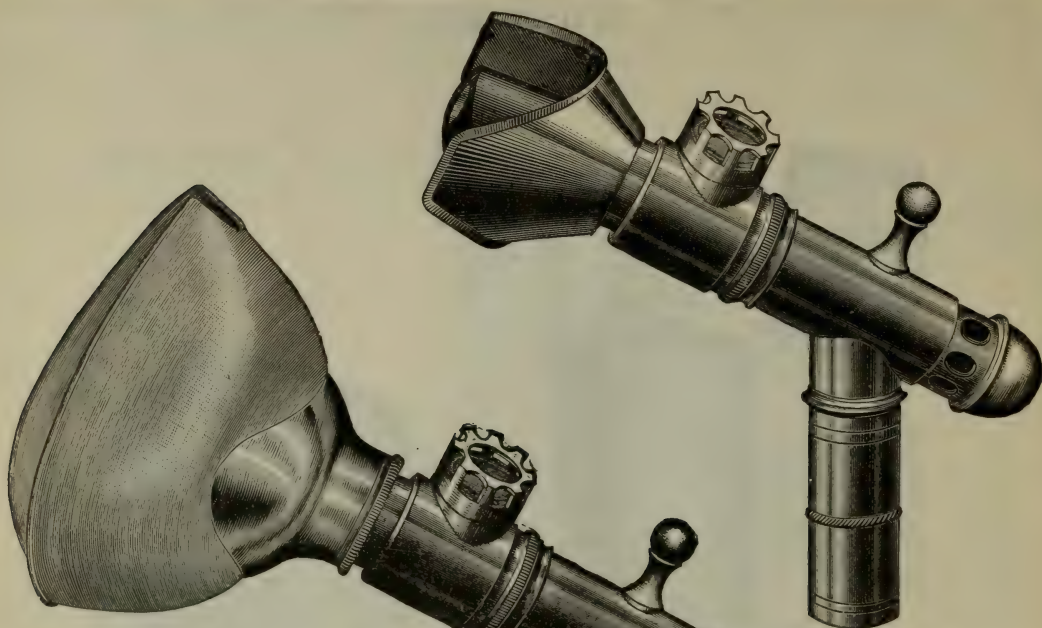
The outfit consists of the Case, a Cylinder containing at least 100 gallons (usually more) of Nitrous Oxid, liquefied, with Gas-bag, Inhaler No. 3, with either Metal, Flexible, or Inflatable Face-piece as desired, and the necessary tubing. A small stop-cock inserted in the tubing between the bag and cylinder enables the operator to shut off the gas and disconnect the bag from the cylinder, if desired for use where it is not convenient to carry the cylinder.

PRICES

No. 5, Complete Apparatus, with 4½-gallon Bag, in Stout Metal Case, handsomely japanned	\$26.75
No. 6, the same, with 7-gallon Bag	27.50

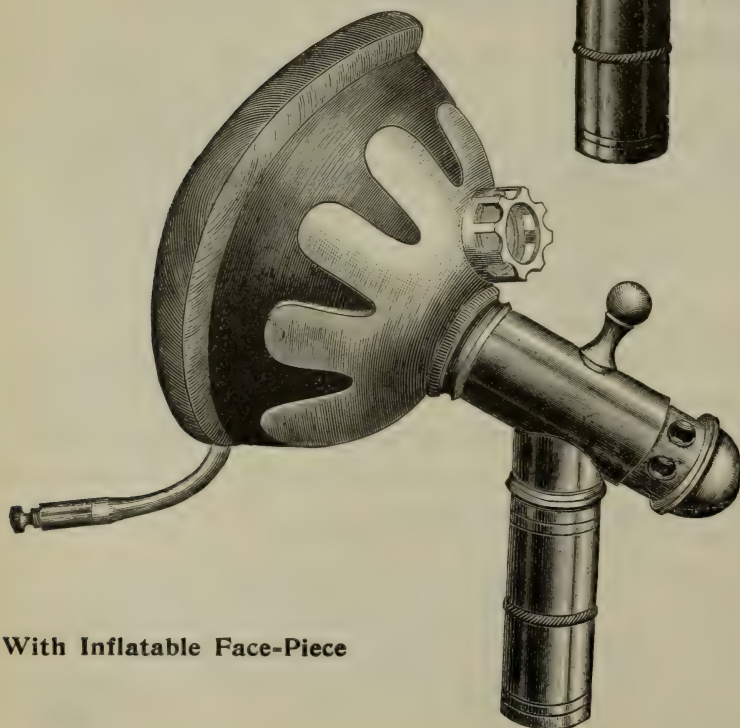
NITROUS=OXID INHALER No. 3

Patented December 13, 1887; February 14, 1888



With Flexible Face-Piece

With Metal Face-Piece



With Inflatable Face-Piece

PRICE—
INHALER No. 3
WITH EITHER
FACE-PIECE
\$8.00

NITROUS=OXID INHALERS

[SEE OPPOSITE PAGE]

In the administration of Nitrous Oxid for the production of anesthesia the Inhaler is an important factor. It should be one which requires the least possible manipulation, that is, one which acts as nearly as possible automatically.

The Inhaler illustrated on the opposite page is nearly ideal in its action. It is unquestionably the best of its class. A slight pressure of the thumb upon the movable cap opens the inlet valve admitting the gas to the Inhaler. Removal of the pressure closes the inlet automatically, shutting off the gas. The opening and closing of the inhaling and exhaling valves are also automatic,—the breathing of the patient operates them.

This Inhaler is of the simplest construction compatible with the work it does.

Shown with three forms of face-piece.

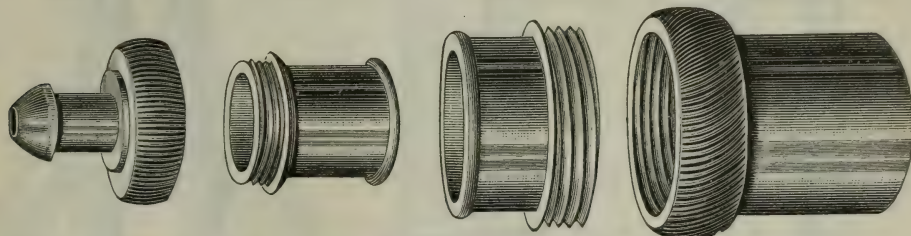
METAL CONNECTIONS FOR GAS BAGS

FIG. 1

FIG. 2

FIG. 3

FIG. 4



The tubing and bag are joined by metallic screw-connections, as shown above. By their use anyone can attach either tubing or bag when necessary.

DIRECTIONS

Figs. 1 and 2 connect the small end of bag to the rubber tubing.

Figs. 3 and 4 connect the large end of bag to the covered tubing.

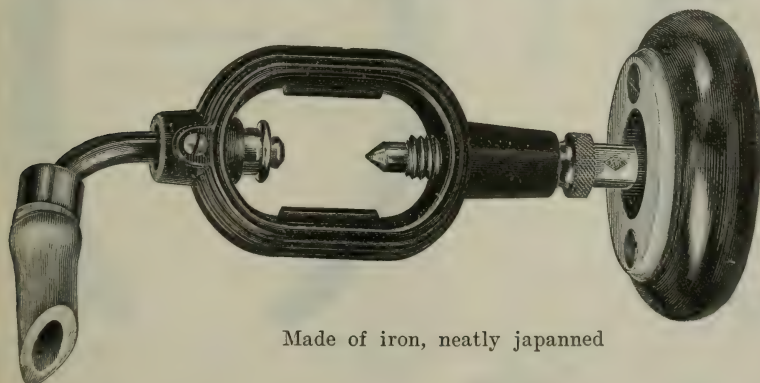
Insert Fig. 1 in the rubber tubing, and screw Fig. 4 over the covered tubing.

In inserting Figs. 2 and 3, bind with copper wire or good strong twine, which may be neatly covered with material corresponding in appearance to that of the bag.

The parts must be screwed together until firmly seated on the leather washers.

Priceper set \$0.50

GAS CYLINDER YOKE CONNECTION



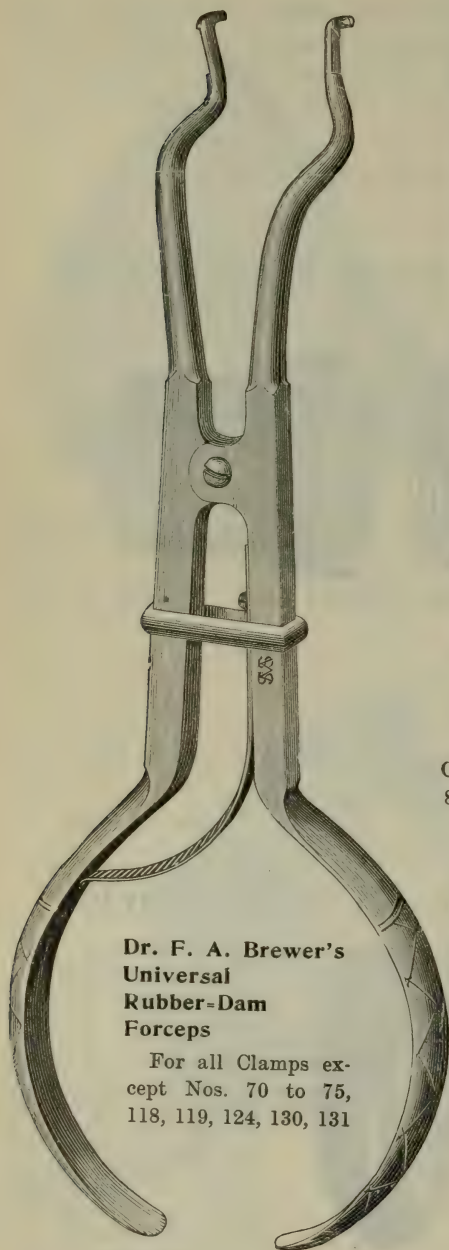
Made of iron, neatly japanned

PRICES

This convenient Connection is applicable to any cylinder, although intended more especially for use with our Surgeon's Cases. It makes a safe, tight attachment between the cylinder and the gas-bag. The metal tube for the hose leading to the gas-bag can be turned as desired and fixed securely with the set-screw seen at the left. The Connection is operated by the same wheel-key which opens the cylinder.

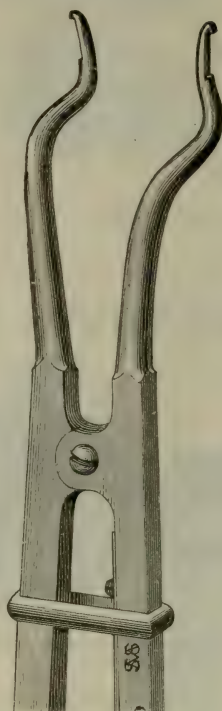
Yoke Connection	\$1.00
Wheel-key .....	.50
Thimble, nickel-plated .....	.10

RUBBER-DAM CLAMP FORCEPS



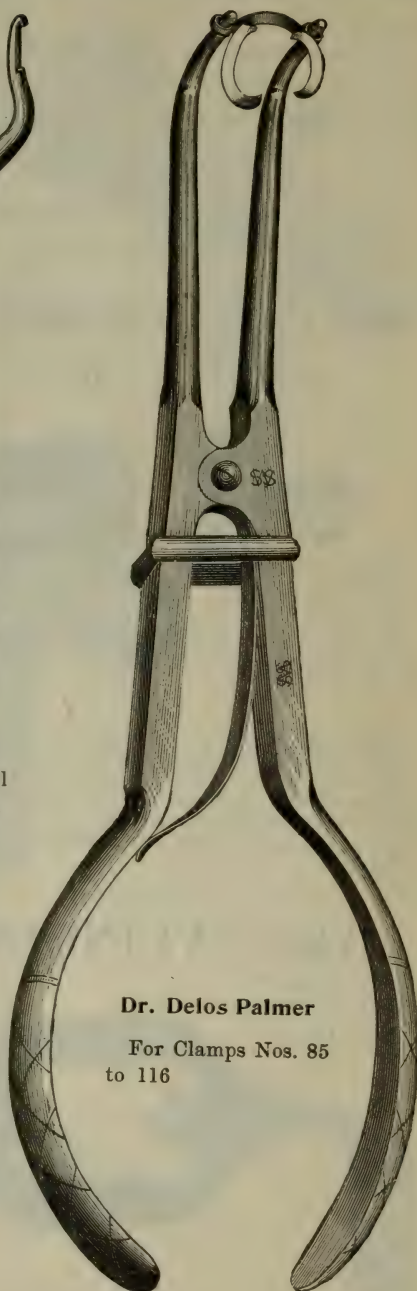
**Dr. F. A. Brewer's
Universal
Rubber-Dam
Forceps**

For all Clamps ex-
cept Nos. 70 to 75,
118, 119, 124, 130, 131



Bowman-Allen

Adapted for all
Clamps except Nos.
85 to 119



Dr. Delos Palmer

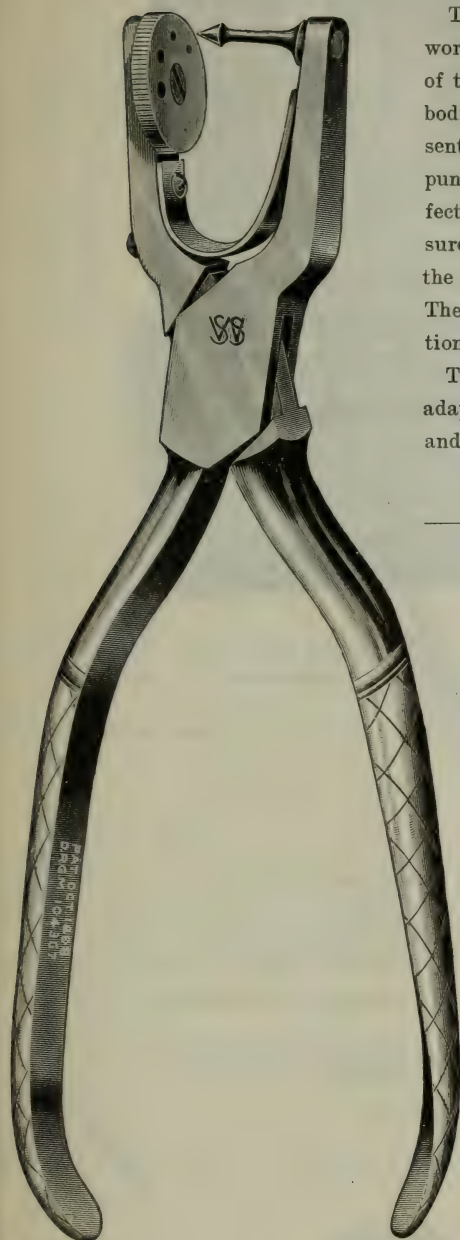
For Clamps Nos. 85
to 116

PRICES

Brewer's Universal Forceps, Nickel-plated	.....	each	\$3.00
Bowman-Allen	.....	"	2.50
Delos Palmer	.....	"	2.50

The Perfected Rubber-Dam Punch

Patented January 16, 1894; October 18, 1898. D. R. G. M. No. 104,367



The general design of this Punch is like that of the Ainsworth, which for many years was the most popular appliance of the kind before the profession. The "Perfected" Punch embodies all the improvements made in the Ainsworth and presents some original advantages of its own. The rigid cone punch is superseded by a flexible-stemmed punch which perfectly impinges upon the edge of each of the four dies and insures a quick, clean cut without liability to strike the side of the hole, failing to make a complete cut, or damaging the die. The improvement, therefore, besides insuring perfect perforations, increases the life of the Punch.

The handles have the specially convenient "Common Sense" adaptation to the hand which we now apply to all new forceps and similarly handled instruments.

Priceeach \$3.00

Approximal Trimmers

Nos. 1 and 2 designed by DR. GORDON WHITE; Nos. 3 and 4 by DR. E. K. WEDELSTADT



This set of four Approximal Trimmers covers a good deal of territory in the trimming of approximal fillings, more especially at the cervical margins.

When first brought out, Nos. 1 and 2 were of the sickle shape shown. Afterward this form was changed to a full curve. After several years' experience, Dr. White decided to return to the original sickle shape as being more generally useful. Scaler edges on both convex and concave faces adapt them to either the

push or pull cut. Useful also for trimming the approximal sides of roots preparatory for crowns.

Nos. 3 and 4, in addition to the sickle curve, have a lateral bend, adapting them readily to trim mesial or distal fillings in molars and bicuspsids.

Made for Cone-Socket Handles only.

Priceeach \$0.35

CASE FOR PALMER'S SET OF THIRTY-TWO CLAMPS



To make selection easy and provide a neat way of keeping the Palmer set, we make the Case shown. Each Clamp has its individual wooden peg, labeled and numbered to correspond with the numbers on the Clamps, and there is a place also for the Forceps.

The Case is leather-covered, lined with satin and velvet. We also supply a plain pasteboard box, with the same arrangement for holding the Clamps.

PRICES

Morocco Case, lined with Satin and Velvet.....	\$5.00
The same, with set of Thirty-two Clamps and Palmer's Nickel-plated Forceps.....	26.50
Pasteboard Box, containing the same arrangement for the Clamps	2.50
The same, with set of Thirty-two Clamps and Palmer's Nickel-plated Forceps.....	24.00
Substituting the Universal Clamp Forceps for the Palmer adds \$0.50 to the price of complete set.	

THICKENED RIM SAND-PAPER DISKS

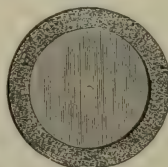
Invented by J. W. SMITH, D.M.D.

The advantage of this style of Disk is the thickened rim. Only this is charged with the abrasive material. All the remainder of the body of the Disk is smooth. This narrow rim of working material permits the operator to cut out small spots of superficial decay without interfering with the surrounding sound portion. He can also dress off any irregularity of a filling operation with the greatest nicety.

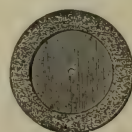
Two sizes, $\frac{5}{8}$ and $\frac{3}{4}$ inch in diameter.

Two grits: 00, or Fine; No. 1 or Coarse.
Put up in boxes of 400, separately or assorted

Used with Mandrels Nos. 303, 310, 311, 312, 313, 315, 317, 318, and 321.



$\frac{5}{8}$ in. Diameter

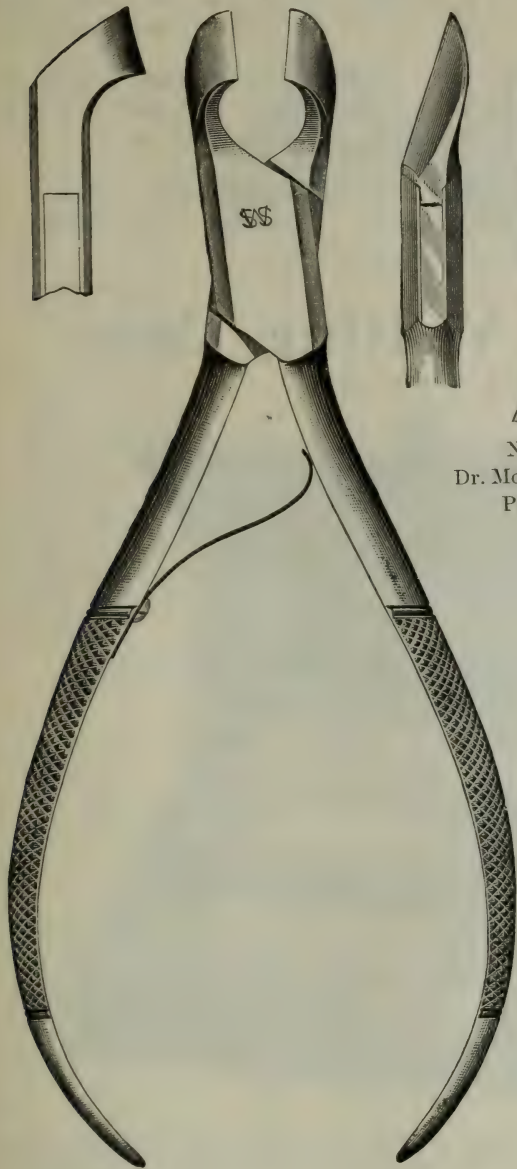


$\frac{3}{4}$ in. Diameter

In ordering, state size and grit wanted.
Price, either size or grit.....per box \$1.00

Wedge=Cutters

FOR EXCISING THE ENDS OF SEPARATING
WEDGES



No. 1

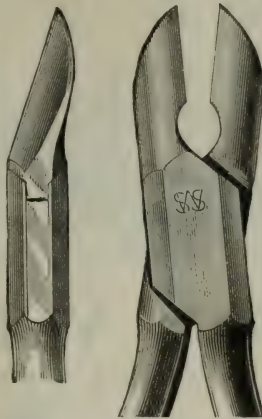
Of the same style, quality, and finish as our
Extracting Forceps.

No. 2 is like No. 1, except in the shape of the
blades.

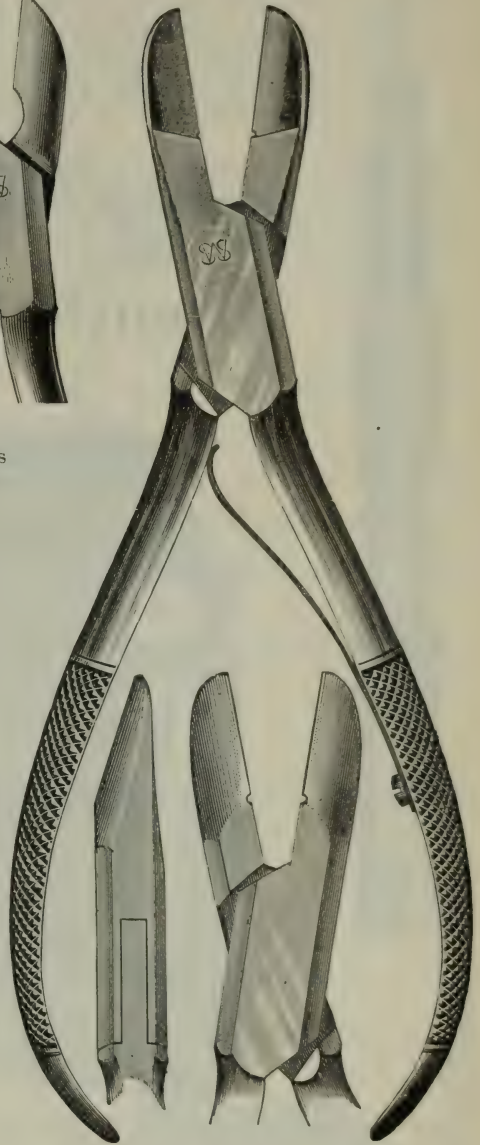
No. 1,	6 inches long, as shown	.....each	\$3.00
" 1,	5 " " " " " " " " " "	..... " "	3.00
" 2,	5½ " " " " " " " " " "	Dr. Morrison's. " "	3.00

Wedge=Cutter and Wedge=Compressor

Design of DR. CHAS. MILLER



No. 2
Dr. Morrison's
Pattern



No. 3

In the No. 3 Wedge-Cutter the parts between the blades and the joint are made broad and flat, and come together like pliers to compress the wedge before it is inserted. Thus condensed it may be put in without great force or painful driving, and will afterward expand so as to be very effective.

Priceeach \$3.00

ENGINE Mallet No. 4

Patented August 13, 1889, and August 19, 1890

Engine Mallet No. 4 has the directness and effectiveness of the hand-mallet blow combined with the speed of the electric; adjustability of the force of the blow to suit the needs; a condensing force the same at the slowest speed as at the highest; easy means for arresting the blow without stopping the running; simplicity and compactness of construction; durability.

It takes the regular Automatic Mallet points; it works with the Engine running in either direction; it is easily kept in order, and its durability is assured by careful proportioning and the liberal use of hardened steel at wearing points.

PRICES

With Fitting for Nos. 4, 6, 7, and 8 Hand-Pieces, or No. 2 Slip-Joint.... \$8.00

With Fitting for Doriot Hand-Piece A.....10.00

Be sure to specify in ordering which fitting is wanted.



Dentist's Visiting Case

Suggested by DR. E. C. MOORE



With this convenient Case at hand the dentist is always prepared for a sudden call to a patient who for any reason cannot come to the office. It contains the medicaments, instruments, and appliances for the relief of an aching tooth, whether caused by a congested pulp or an abscessed root.

The Case contains five rubber-stoppered homeopathic medicine phials, a vulcanite syringe, a supply of absorbent cotton and of bibulous paper, an explorer, a drill, two excavators (hatchet and spoon), a mouth mirror (No. 3), an ebony handle lancet, a pair of pliers (No. 5), a broach-holder, and a floss-silk holder (filled). The steel instruments are all our make, and bear the trade-mark. The instruments are all practical, work-a-day appliances, and can be used just as well in regular office practice.

The Case is 8 inches long, 4 inches wide, 2 inches deep, a convenient pocket size. It is covered with leather and lined with velvet, with spaces for the appliances let into the blocks.

Price, complete, as described \$9.00

TRADE MOSS FIBRE GOLD MARK

REGISTERED No. 32,538



A Bit of Moss Fibre Gold Magnified 100 Diameters

There is economy in the use of Moss Fibre Gold,—no waste, every bit usable gold.

It has the maximum of plasticity and cohesiveness—it fills faster.

It makes a dense, durable filling, with the hardest surface of which gold is capable.

Moss Fibre is strongly individualized; it differs from other golds.

The dentist who thinks that gold is gold and that he knows all about using it will be likely to slip up with Moss Fibre.

But the operator who is willing to learn, who will use Moss Fibre according to directions, will find it justifies every claim ever made for it.

Moss Fibre Gold can be packed by hand pressure or mallet blow, can be used for the entire filling, for the greater part, or merely to start it.

Price per $\frac{1}{2}$ oz. \$4.00

“ in lots of $\frac{1}{2}$ -oz. or more per oz. 30.00

A sample box of 12 grains, to show you its superior qualities, will be sent for \$1.00.

Little Giant Separator

Invented by DR. H. W. GILLET

Design Patent June 23, 1898. Patented August 20, 1897


Small size, simplicity, and effectiveness are the special claims of this Separator to favor.

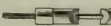
Its special use is in the immediate separation of teeth having small approximal cavities, though it can be used effectively wherever there is room to place it.

In use the nut and loose wedge are removed and the shaft passed between the teeth to be separated from the lingual or palatal side. The loose wedge is then returned to the shaft, followed by the nut, which is screwed up, forcing the wedges between the teeth till the desired room is gained. The nut is manipulated by a key or wrench, magnetized to enable it to pick the nut up readily. The round recess in the wrench is for handling the small, loose wedge of No. 1.

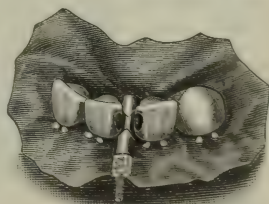
It is a mechanical “quick wedge.”

Three sizes: No. 1 for use between incisors, Nos. 2 and 3 for bicuspsids and molars. They may also be used as matrix holders. In matrix operations the Separator may often be applied without removing wedge or nut.

 No. 1

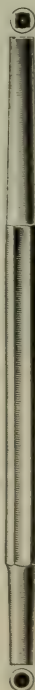
 No. 2

 No. 3



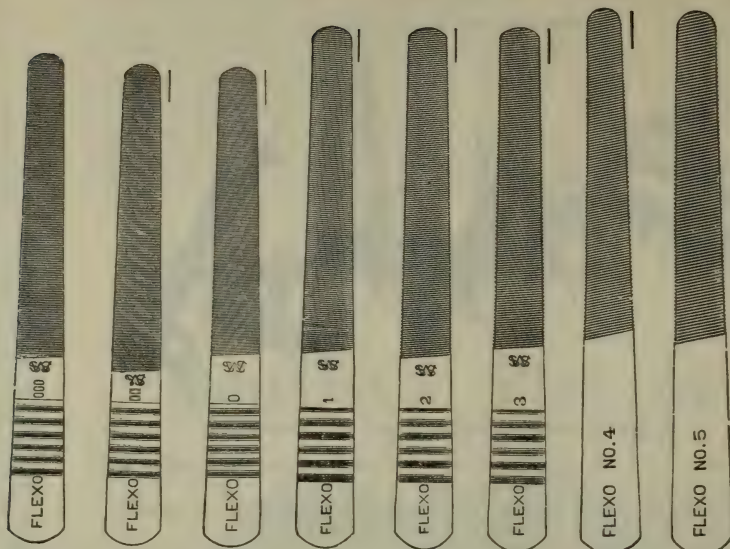
PRICES

Set complete	\$3.75
Separately, No. 1, No. 2, or No. 3.....each	1.15
Wrench .....	.40



"FLEXO" SEPARATING FILES

Registered June 3, 1890



The "Flexo" Separating Files can be bent, a little at a time, between the thumb and fingers, to adapt them to the contour of the tooth operated upon.

All of the "Flexo" Separating Files are cut on both edges and one side, the other side being smooth or "safe."

Nos. 000 to 3 have crimped finger-hold; in Nos. 4 and 5, the two coarser cuts, the hold is smooth. Sold separately by number, or in assorted dozens.

Price, Nos. 000 to 5.....per doz. \$1.00

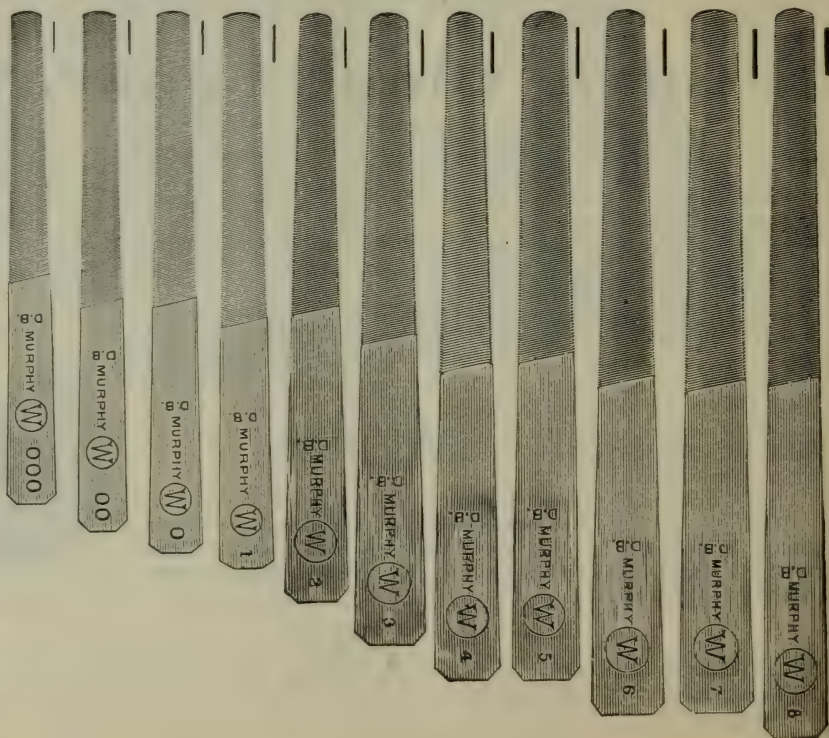
MURPHY'S SEPARATING FILES

The Murphy Separating Files afford a wide range of sizes and cuts, from the almost polishing face of No. 000 to No. 8, eleven sizes in all, with almost as great a range in cut of working surface. The finer files are almost mere lines in thickness; the coarser ones are perceptibly heavier.

In the regular line, Nos. 000 to 4 and 6 have one safe side; Nos. 5, 7, and 8 are cut on both sides. All have the push-cut. Put up in dozen packages containing one of each number separate, or assorted.

PRICES

No. 000 ...each \$0.12
per doz. 1.25
Nos. 00 to 8,
each .10
per doz. 1.00
Assorted,
per doz. 1.00



Perforated "Flexo" Files

Suggested by W. B. FAHNESTOCK

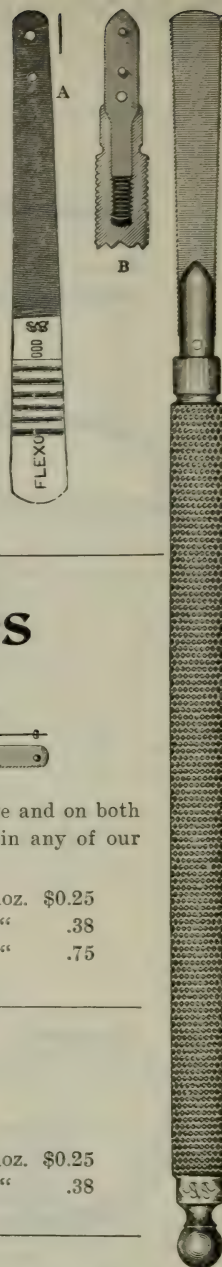
The Perforated "Flexo" Files can be used as push-cut instruments, and by fixing in a holder, for draw-cutting. The modification is an economy in that it prolongs the life of the file by affording a ready means for using up its entire working surface.

Two perforations toward the end of the file fit the pins in the chuck of the Dr. Gordon White Separating Saw (shown in sectional view). When the point of the file becomes worn, the finger-hold section is cut off and the file set in the holder, making an excellent and practically new draw-cut file over which the knurled Cone-Socket Handle gives perfect control.

The Perforated "Flexo" Files, are made in Nos. 000, 00, 1, and 2.

Price, Perforated "Flexo" Files, Nos. 000, 00, 1, and 2,
each \$0.10, per dozen \$1.15

"	Chuck File Holders.....	each	.35
"	Socket Handles (No. 3).....	"	.15
"	Complete, one File, Chuck, and Handle.....		.60
"	Complete, Chuck, Handle, and Assorted Dozen Files....		1.60



"Flexo" Saws and Files

For Saw-Frames Nos. 1 to 5 and Wilson's

Saw for Saw-Frames



File for Saw-Frame



The "Flexo" Saws for Saw-Frames are made in two styles, toothed on one edge and on both edges; the Files for same use are cut on one side and one edge. Can be used in any of our Saw-Frames.

Price, Saws for Saw-Frame, cut on one edge.....	per doz.	\$0.25
" " " " " " both edges	" "	.38
" Files " " " " one side and one edge.....	" "	.75

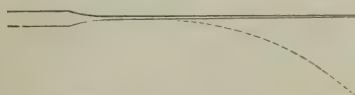
Kaeber Saws

For Saw-Frames Nos. 1 to 5 and Wilson's

Price, cut on one edge.....	per doz.	\$0.25
" " " both edges	" "	.38

"Flexo" Plug-Finishing Files

Suggested by Dr. H. F. Libby

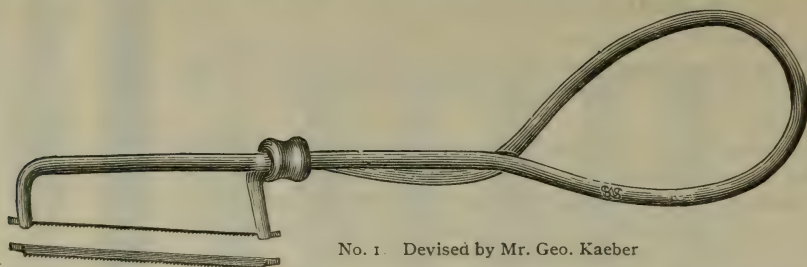


adapt it specially for finishing approximal fillings near the gum-margin.
The dotted line in the edge view shows its possible curvature.

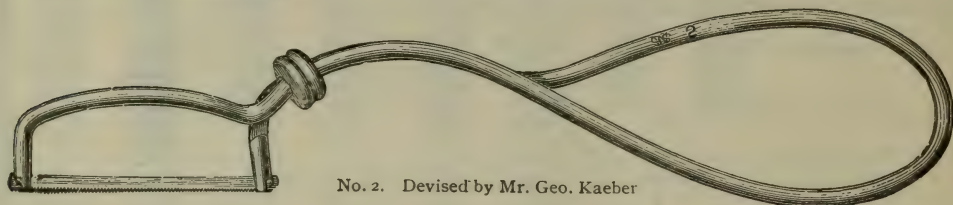
Priceper doz. \$1.75

This file is made quite thin, cut on only one side, with both edges slightly beveled from the cutting side, rounded, and smooth, to

Saw-Frames and Saws



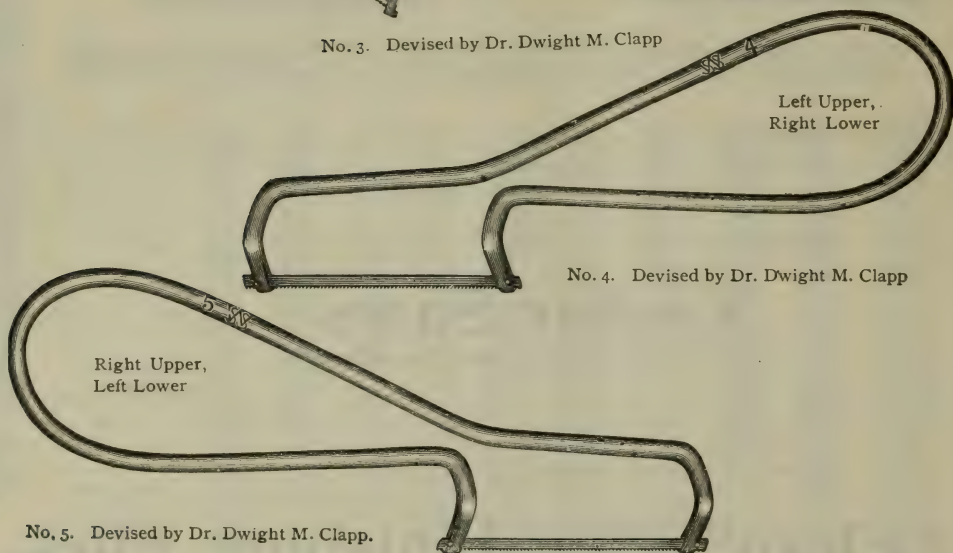
No. 1. Devised by Mr. Geo. Kaerber



No. 2. Devised by Mr. Geo. Kaerber



No. 3. Devised by Dr. Dwight M. Clapp



Left Upper,
Right Lower

No. 4. Devised by Dr. Dwight M. Clapp

Right Upper,
Left Lower

No. 5. Devised by Dr. Dwight M. Clapp.

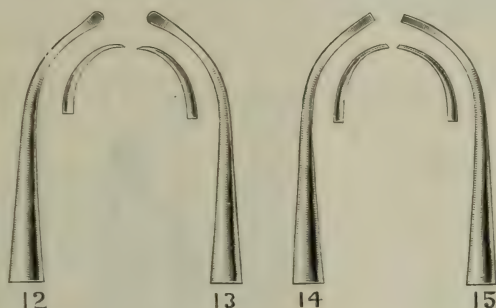
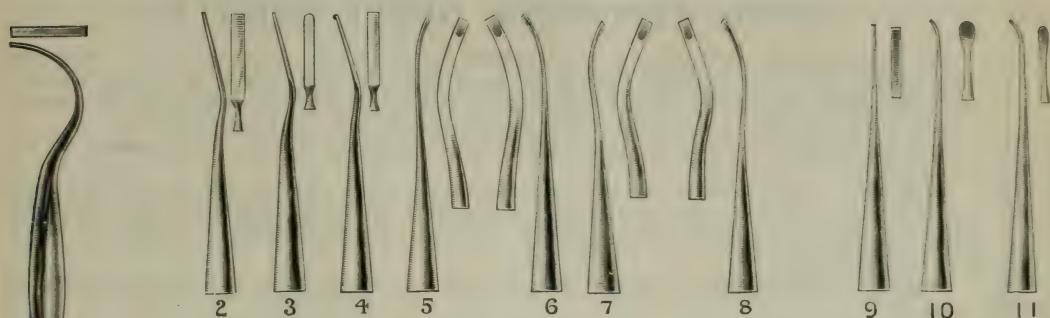
Saw-Frames Nos. 1 and 2 are supplied with a sliding ring, which holds the saw firmly and guards against its bending or breaking while in use.

Saw-Frames Nos. 3, 4, and 5 hold the saw by the spring of the steel wire. Nos. 4 and 5 have the saw-holding ends bent at an angle to the handle part for convenient use between the posterior teeth.

PRICES

Kaerber Frame No. 1, with one Saw	\$0.60
" " " 2, " " "	.75
Clapp " " 3, " " "	.30
" " " 4, " " "	.40
" " " 5, " " "	.40
Files, "Flexo," to fit Saw-Frames Nos. 1 to 5, cut on one side and one edge....per doz.	.75
Saws, "Flexo" for Frames Nos. 1 to 5, cut on one edge	.25
" " " " " " " both edges	.38

Revised Set of Pyorrhea Instruments



This set of fifteen instruments is suggested by Dr. R. B. Adair as very completely covering the needs in removing calicular deposits from the roots of teeth.

It comprises several points from the set long known as Dr. Allport's, others from the same set modified to increase their efficiency, and still others put forward by Dr. Adair.

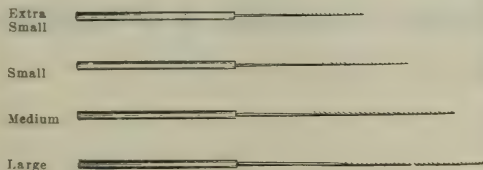
The shapes, sizes, and curves of each individual instrument have been carefully studied out to the end of giving it the greatest efficiency.

As an example, Nos. 5-6, 7-8, which are pairs of right and left Allport instruments modified, have considerably different curves from the old forms. In each of them also, the end of the blade is concaved on the cutting side to better adapt it to the contour of the root, while the back is rounded to prevent unnecessary irritation or wounding of the gum tissue.

Made for Cone-Socket and Long Handle.

Price, Long Handle	each	\$0.50
" Cone-Socket Points	"	.35

BARBED NERVE-EXTRACTORS



These sizes mean lengths, not diameters

ALL SIZES, IN "SOFT" AND "HALF-SOFT" TEMPER

ASSORTED SIZES	ONE DOZEN	SOFT & HALF-SOFT
NERVE-EXTRACTORS		
The S.S. WHITE DENTAL MF'G CO.		
New York, Boston, Chicago, Brooklyn,	PHILADELPHIA,	Berlin, Buenos Aires, St. Petersburg, Toronto.
Atlanta, Rochester,		

This label is our guarantee of the quality of our Extractors

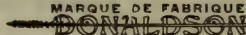
Think what the Ideal Broach should be,—how thin, how tough, how perfectly barbed. These of ours are nearer the ideal than you will find elsewhere.

SOLD IN SEALED PACKAGES, AS FOLLOWS:

- No. 1, containing one dozen assorted small, extra small, medium, and large sizes,—Soft and Half-Soft.
 No. 2, containing one dozen extra small,—Soft and Half-Soft.
 No. 3, containing one dozen small,—Soft and Half-Soft.
 Other assortments to order without extra charge.

Price	per package	\$0.50
"	per gross	5.00

Dr. Donaldson's Root-Canal Instruments

Master  Schutz.
MARQUE DE FABRIQUE
DONALDSON
Déposée en France.
Geschützt im Deutschen Reich

SPRING-TEMPERED NERVE-BRISTLES

The Donaldson Spring-Tempered Nerve-Bristles are very thin and very tough. They are thin enough and have sufficient rigidity to enter any root-canal which is not obliterated; they are tough enough to stand a considerable strain, can be bent almost as the dentist pleases without breaking, they will follow the canal, and they are spring-tempered.

They are "regular" in quality,—one varies little from another; they are dependable all the time.

Made with a sharp hook at the end for removing the pulp, with the end slightly roughened for carrying a shred of cotton for cleansing the canal or for treating an abscess, and with plain end. Supplied with polished vulcanite handles as shown, or without handles for use in the Broach-Holder.

Those with Handles always sent when the order fails to specify the kind wanted

Put up in boxes or packages of half-dozen as follows:

PRICES

No. 1. Four hooks and two roughened (handles)	}	per box	\$1.25
No. 2. All hooks (handles)		each	.25
No. 3. Four hooks and two roughened (no handles)	}	per pkg.	.75
No. 4. All hooks (no handles)		each	.15
All roughened (handles)	}	per box	1.25
All plain (handles)		each	.25
All roughened (no handles)	}	per pkg.	.75
All plain (no handles)		each	.15



PULP-CANAL CLEANSERS

The barbs of the Donaldson Pulp-Canal Cleansers are cut regularly in length, in position, and in angle, forming a broken screw-thread, which facilitates the entrance of the Cleanser into the canal, and assists in its withdrawal. Should the Cleanser become "jammed," a backward turn or two will at once release it. The barbs, which project backward, also engage with the pulp-substance, so as to pull it out when the Cleanser is withdrawn.

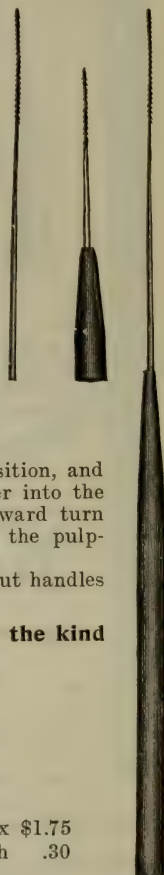
Made of tough steel piano-wire, with long and short vulcanite handles; also without handles for use in the Broach-Holder.

The long Handles are always supplied when the order fails to specify the kind wanted

Put up in boxes or packages of half a dozen as follows:

PRICES

No. 1. Assorted sizes (handles)	}	per box	\$1.75
" 2. All fine (handles)			
" 2. All medium (handles)			
" 3. Assorted sizes (short handles)			
" 3. All fine (short handles)			
" 3. All medium (short handles)			
" 4. Assorted sizes (no handles)	}	per pkg.	1.25
" 4. All medium (no handles)			
" 5. All fine (no handles)			
" 5. Extra fine (no handles)			
" 6. Assorted, for Adjustable Holder (no handles)			
" 6. All fine, for Adjustable Holder (no handles)			
" 6. All medium, for Adjustable Holder (no handles)			
"B" Between fine and medium (no handles)			



DENTISTS' FLOSS SILK

Our Dentists' Floss Silk is intended to be the best of its kind. To this end, only the best selected Japanese and Chinese stock is used; it is free from adulteration or dye; the original strength of the Silk fiber is conserved and concentrated. The finished Silk has no knots, is smooth and uniform in texture. It is what it is intended to be, the best of its kind.

Our Waxed Floss Silk is like the Plain, except that it is treated to a bath of pure white wax to make it easier of placing in narrow spaces.

In a word, we offer Floss Silk unequalled in the qualities which best serve the dentists' uses.

Plain and Waxed, put up in 12-Yard, 24-Yard, and 150-Yard Spools

PRICES

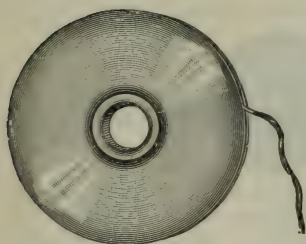
		Per gross	Per half-gross	Per dozen	Per spool
PLAIN	12 yd. (Black Boxes)	\$7.00	\$3.75	\$0.75	\$0.08
	24 " Red "		6.25	1.35	.15
	150 " Black "		38.25	8.00	.75
WAXED	12 " " "	9.50	5.00	1.00	.10
	24 " Red "		9.50	2.00	.20
	150 " Black "		45.50	9.50	.90

The Waxed is also supplied in 6-yard Spools, just the right size for refilling our Floss Silk Holders.

Price, Waxed, 6-yard Spools.....per half-gross, \$3.00; per dozen, \$0.60; per spool, \$0.06

FLOSS-SILK HOLDERS

No. 1, S. S. White

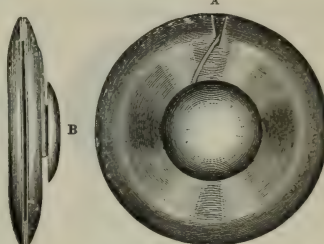


Plain

A holder for the pocket, made of steel, nickel-plated, carrying six yards of waxed floss silk.

Price, each	\$0.30
" in 1-doz. lots.....	3.00
" " 3 " "	7.88

No. 2, Sullivan's



With Dr. G. A. Sullivan's Improvement

The improvement consists in the V-shaped slot A, and the raised disk B. After using, the silk is drawn into the slot, a single turn taken under the disk, then a slight pull against the edge of the disk cuts off the used portion and leaves the end easily accessible.

Price, each\$0.50

THE S. S. WHITE DENTAL MFG. CO.'S ABSORBENT COTTON

This Absorbent Cotton is clean, pure, long-fiber cotton, made hygroscopic by the extraction of the natural oils. An excellent absorbent,—acts quickly. Put up in the form of a roll, easily torn apart, yet retaining its form nicely.

Sold in 1-oz. and 2-oz. cartons and 1-lb. rolls.

Price	per 1-oz. carton	\$0.06
"	" 2 " "	.10
"	1-lb. roll	.40

COTTONOID

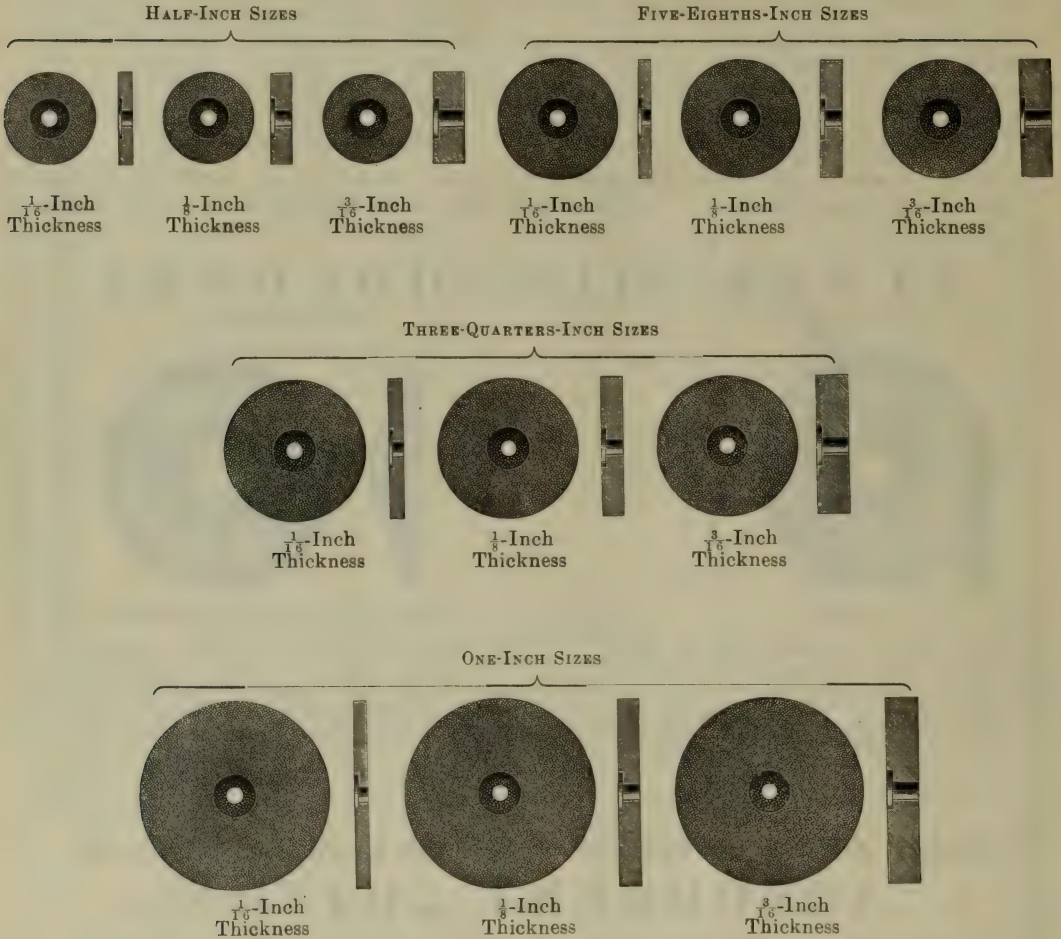
Cottonoid is a preparation of the most perfect absorbent cotton, much resembling the well-known Fibre Lint in appearance. It is very useful in any way desired as a dental absorbent, as it can be cut to any size. Sold in sheets 12 inches long by 3½ inches wide, and put in ¼-lb. boxes. This quantity will make 200 napkins of the size used in the Duddy Holder.


Price¼-lb. package \$0.25



Carborundum Wheels, Disks and Points

WHEELS



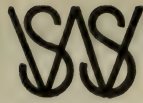
The  make of Carborundum Wheels, Disks, and Points are properly molded, uniform in sizes, are dense and strong, and give practical proof of durability.

The centers are recessed at one side for the reception of the screw-head of the mandrel.

The Wheels are made in three grits, fine, medium, and coarse,—the first as fine as is ever needed in dentistry, the coarse quite coarse, and the medium an intermediate between, each differing from the other enough to be marked.

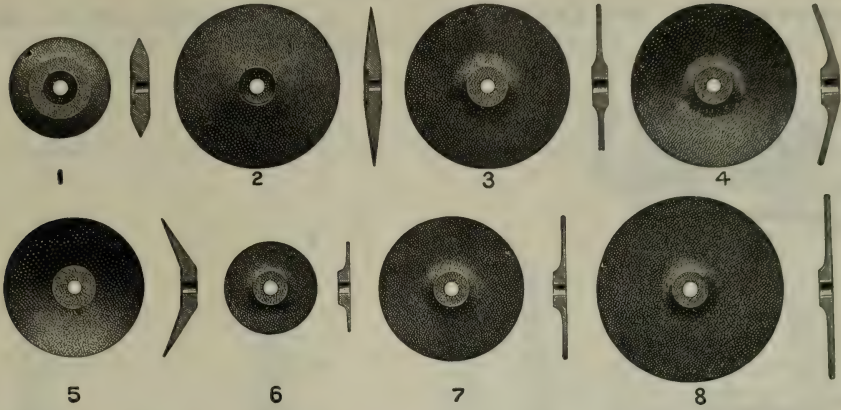
PRICES

Wheels, any size or thickness.....each \$0.08; per doz. \$0.90



Carborundum Wheels, Disks and Points

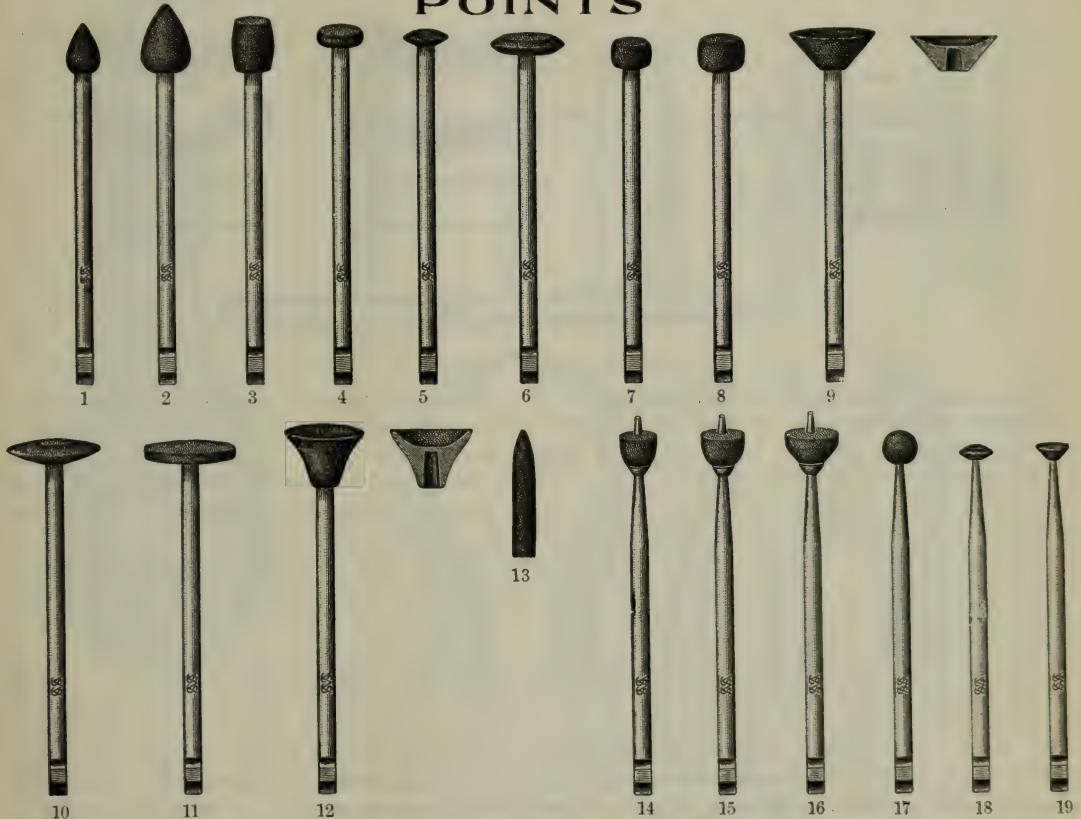
DISKS



The Carborundum Disks are made in two grits, fine and medium.
Adapted for Mandrels Nos. 303 and 321. Nos. 1 and 2 have recessed centers to take the heads of the mandrels. The others are too thin to admit of this.

Priceeach \$0.08; per doz. \$0.90

POINTS



The Carborundum Points are made in two grits; Nos. 14, 15, and 16 in medium and coarse; all others in fine and medium.

Priceeach \$0.05; per doz. \$0.50
" mounted " .15; " 1.50

CONTOUR MATRIX No. 5

FOR

Incisors and Cuspids

Invention of DR. WM. CRENSHAW

Patented April 26, 1904

Fig. 1

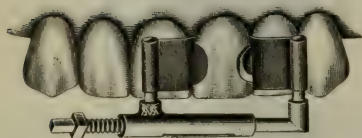


Fig. 2



Fig. 4

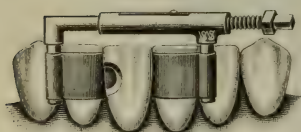


Fig. 5

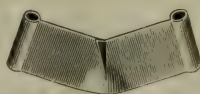


USUAL BEVEL

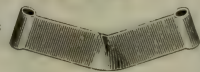


ABRUPT BEVEL

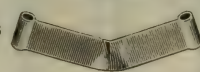
5-1



5-2

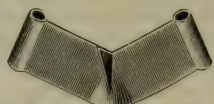


5-3

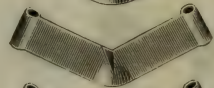


Shallow Crimp Ribbons
FOR
Teeth of Usual Bevel

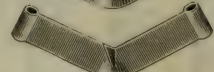
5-4



5-5



5-6



Deep Crimp Ribbons
FOR
Teeth of Abrupt Bevel



Key

Thousands of dentists know the advantages of Dr. Crenshaw's Contour Matrix in the filling of Bicuspids and Molars. All of these at least will welcome the additional form, No. 5, which extends the benefits of the principle to the filling of incisors and cuspids.

The Anterior Teeth Matrix consists of a set of six ribbons and a holder which takes and tightens any of the ribbons, adapting them to the form of the tooth to which they are affixed. There is also a key for manipulating the holder, which is operated by a screw.

The ribbons are in two series of three each, respectively for teeth of the usual bevel and those of more abrupt bevel, as seen in Fig. 5. The three widths in each series are for teeth of varying lengths. They are numbered 5-1, 5-2, etc., to distinguish the various sizes and also to show that they are a part of Matrix No. 5.

Figs. 1, 2, and 4 show the Anterior Teeth Matrix in position. With this Matrix approximal cavities in the incisors of both jaws may be filled almost entirely with soft gold. The fillings thus made are not only better preservers of the teeth, but are done in less than half the time necessary for cohesive gold work. This method of filling simplifies that class of approximal incisor cavities in the upper and lower jaw where the lingual face of the tooth is removed by decay, and aids the operator particularly in filling the more troublesome approximal cavities of the lower incisors. It admits of giving the fillings such contour as is needed.

Full instructions for use accompany each set.

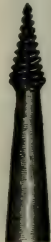
Price, per set, including Holder, Six Ribbons, and Key\$3.50

ROOT EXTRACTORS

Screws, Punches, and Hooks



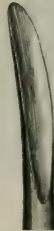
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1



2



3



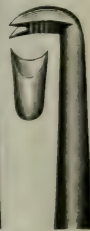
4



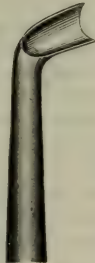
5



6



7



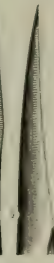
8



9



10



11



12



13



14



15



16



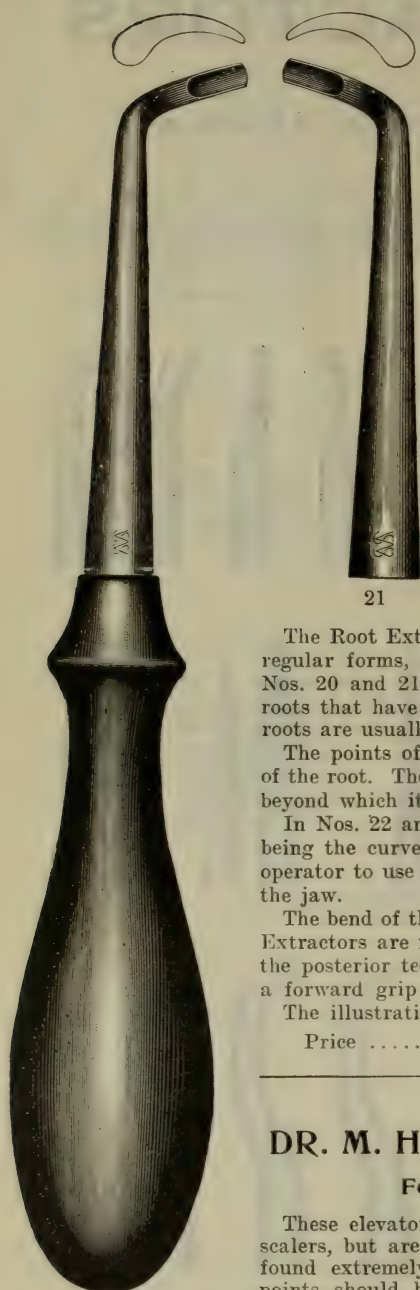
17

This set of eighteen Extractors of various forms will give the operator a wide range for the selection of instruments adapted to the cases with which he has to deal.

PRICE

In Round Ebonized Wood Handles.....each \$0.75

ROOT EXTRACTORS



20

They are so unlike an extracting instrument that patients do not shrink from their use as they do from that of the forceps. Used in cone-socket handles No. 3, 5, 8, or 8A.

No. 1 is Right, No. 2 Left.

Priceeach \$0.50

21

22

23

The Root Extractors here represented have been designed to supplement our regular forms, and we believe their advantages will be readily appreciated. Nos. 20 and 21 are right and left instruments, generally applicable to frail roots that have slight attachment or are merely imbedded in the gum. Such roots are usually crater-like and present thin edges, easily crushed by forceps.

The points of the Extractors are concave, and will closely fit the convexity of the root. The edge is very sharp, and curved to the form of the gum-margin, beyond which it may be easily forced.

In Nos. 22 and 23 the points are of similar form, their distinctive features being the curve of the points and the bend of the shanks, which enable the operator to use the thumb as a fulcrum upon the teeth in the opposite side of the jaw.

The bend of the shank affords an unobstructed view of the operation. These Extractors are much longer than our regular line, and give an easy reach to the posterior teeth, while the handle of ebonized wood is formed to admit of a forward grip in extracting anterior roots.

The illustrations are full size.

Priceeach \$1.00

DR. M. H. CRYER'S ELEVATORS

For Cone-Socket Handles

These elevators are similar in form to right and left scalars, but are made somewhat heavier. They will be found extremely serviceable in extracting roots. The points should be inserted between the root to be removed and the adjoining tooth or root, with the flat side against the root to be removed; then a slight rotary movement will force the root from its socket with but little pain.



1

2

Root Extractors

THIRD MOLAR—RIGHT AND LEFT

Designed by DR. J. F. CANINE

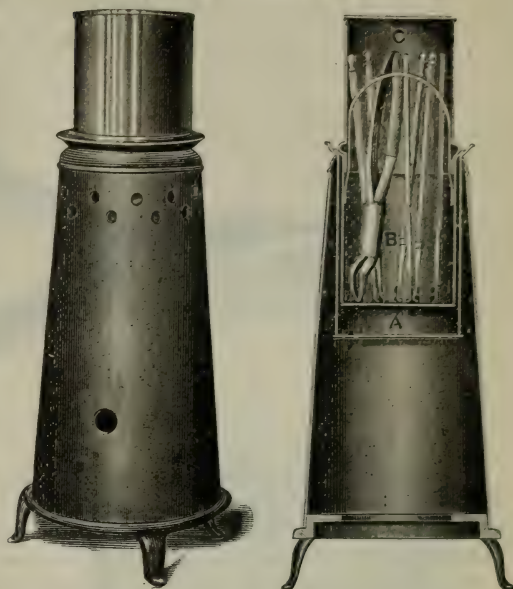


A pair of Right and Left Extractors, specially adapted for third molars in either jaw. The cross-section shows the peculiar shape of the double-groove blades, with one rounded and one sharp edge, these being reversed on the opposite side. The blade is forced from the buccal side as a wedge between the third molar and the molar next to it, with the lower sharp edge presenting toward the neck of the third molar, and the upper toward the crown of the adjoining tooth. Twisting the handle slightly in the proper direction engages the blade under the border of the enamel of the third molar, and the tooth is then readily elevated out of its socket in the direction of the curvature of its roots, the adjoining tooth serving as a fulcrum. The insertion of the instrument is accomplished with little inconvenience to the patient because of its wedge-shape and the separator-like edge of the point.

Price, in Ebonized Wood Handles, each \$1.75

Instrument Sterilizer

Devised by Dr. Edwin Day Downs



The apparatus here shown meets all the conditions for the practical sterilization of dental instruments. It is simple, as well as effective; convenient as well as thorough. It affords a simple means for boiling the instruments, which is the most effective way of destroying the germs. It is convenient because its small size permits it to be placed ready to hand, and it does its work thoroughly.

Some Details

About a half pint of water is sufficient for a charge, and into this should be put a little bicarbonate of soda or phénol sodique.

The boiler, bath, and cap are of copper, tinned inside, the cap being nickel-plated on the outside. The jacket is of Russia iron, and rests on a neat, black-dipped cast-iron base. The height from the table to the top of the cap is 13½ inches.

For supplying the heat—212° F.—any small burner will do. Our Model Annealing Burner with one-fourth of its flame will keep the water hot for instant use, in an economical way. No. 12 Burner, or any annealing lamp, will answer equally well.

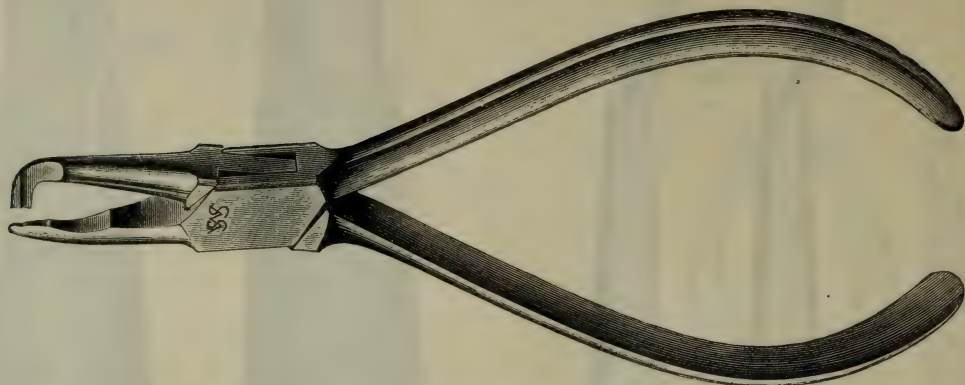
PRICES

Sterilizer, as illustrated, without	
Burner	\$3.00
Sterilizer, with No. 12 Burner..	3.50
Sterilizer, with No. 17 Burner,	
less Shield	3.70

Tooth=Pin Bending Pliers No. 133

Devised by Dr. F. A. GREENE

D. R. G. M. No. 327,337



These pliers afford an effective means for bending the pins of long-pin teeth for any purpose. They are especially useful for bending the pins down upon a metal backing, because they grasp the pin in such a way that the bending puts no strain upon the porcelain or its hold upon the pin. After the pin is bent over, it may be pressed down upon the backing without fear of checking the porcelain.

In the use of long-pin teeth for vulcanite work, the pins can be readily bent in any direction to form the staples which give the vulcanite its hold.

Priceeach \$1.75

The ROBERTS COTTON PELLET ROLLER and WASTE-COTTON HOLDER No. 5

Patented May 5, 1891

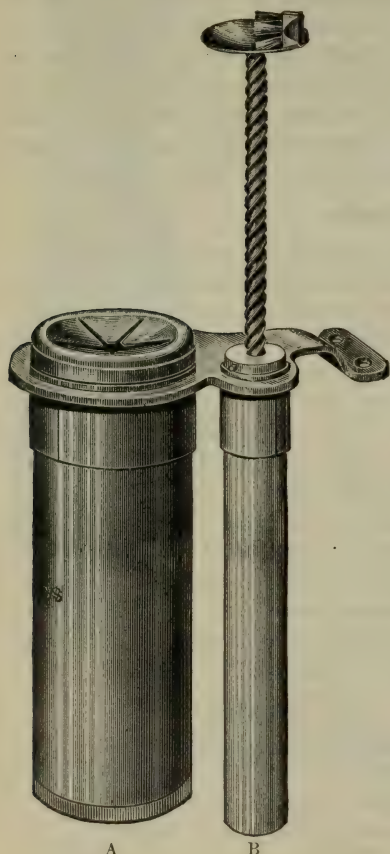
The Roberts Roller makes cotton pellets quickly and cleanly, any size you want, and makes them neither too dense nor too loose, and all without touching the cotton with the fingers. You pick up the wisp of cotton with the pliers, carry it to the disk of the Roller (B), press the disk down to the cylinder, and lift off the pellet perfectly made.

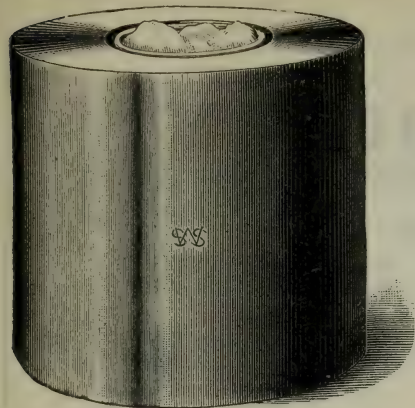
Combining the Roller with Waste-Cotton Holder No. 5 as a receiver for the soiled pellets you have an ideal appliance for making and disposing of cotton pellets. Holder No. 5 is a cylindrical glass cup inclosed in a nickel-plated case with a star-shaped opening in the top. It is held by the same bracket which supports the Roller. The cup is readily removed and cleansed. A disinfectant placed in it will effectually prevent odor from the used pellets, which are scraped off the pliers through the star-shaped opening.

Pellet Roller sold separately or combined with the Waste-Cotton Holder, as illustrated. The combination outfit is a labor-saving attachment to the bracket-table.

PRICES

Roberts Cotton Pellet Roller (B)	\$1.00
Waste-Cotton Holder No. 5 (A)	1.75
Roberts Cotton Pellet Roller and Waste-Cotton Holder	2.75





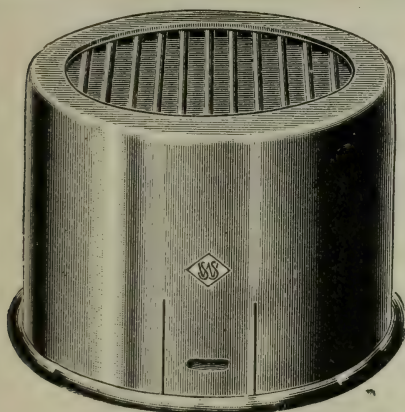
COTTON-HOLDERS AND WASTE-RECEIVERS

No. 1, COTTON-HOLDER

Compact, simple, and effective. Made of brass, $\frac{1}{2}$ inch thick, giving all the weight necessary for holding it firmly in position without loading the base. The cotton is forced up against the opening by a spring soldered to two heavy brass disks, one of which forms the bottom of the Holder, and the other the plate on which the cotton rests. The cotton is thus firmly pressed against the orifice, and is held ready for use at any time.

No. 2

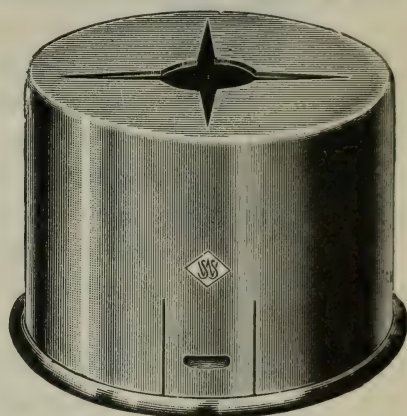
Patented February 28, 1899. D. R. G. M. No. 112,022



No. 2, Cotton-Holder, has a rack over the opening, against which a spring holds the cotton. The bars assist in pinching off the cotton.

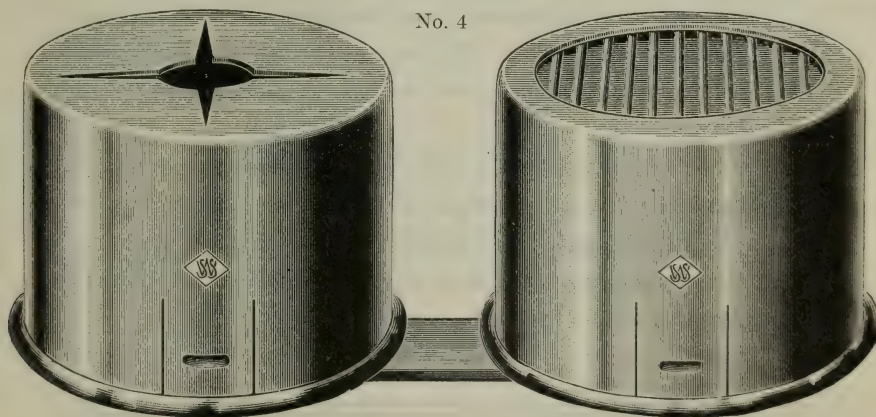
No. 3

Patented February 28, 1899. D. R. G. M. No. 112,022



No. 3, Waste-Receiver, has a star-shaped opening in the top for the quick and cleanly discharge of the used pellets into a glass cup inside.

No. 4



No. 4, Cotton-Holder and Waste-Receiver combined, consists of Nos. 2 and 3 set upon a substantial metal base, at an angle which presents the openings convenient for use.

The metal caps of Nos. 2, 3, and 4 are removed by a little twisting pull. Metal parts nickel-plated.

PRICES

No. 1.	Cotton-Holder	\$0.70
" 2.	Cotton-Holder, separately	1.25
" 3.	Waste-Receiver, separately	1.25
" 4.	Complete, Cotton-Holder and Waste-Receiver	2.50

INTERMEDIARY

AN ANTISEPTIC NON-CONDUCTING PULP-PROTECTOR

Prepared by W. D. DeLong, M.D., D.D.S., and Geo. F. DeLong, D.D.S.



INTERMEDIARY eliminates the liability to pulp-irritation common to all deep cavities filled with gold or amalgam.

It is non-conductive to heat and cold,—no metals or metallic compounds enter into its composition. Applied to the surface of a cavity it prevents thermal shock.

It is non-irritating. Flowed over an exposed, aching, or inflamed pulp, it gives immediate relief.

It is antiseptic,—thoroughly disinfects the cavity and inhibits the growth of bacteria.

It fuses at a little above body temperature, making its application easy for the dentist, comfortable for the patient.

It hardens sufficiently in from one to two minutes—depending on the heat and quantity employed—to permit the packing of gold upon it.

The ease of manipulation—a warmed burnisher flows it—and the successful results which follow the use of Intermediary, appeal to every practitioner and enjoin its use in all except shallow cavities.

In the form of granules, and put up in a shallow saucer-shaped opal glass box or container with screw-cap. The shallow container brings the granules handy to the instrument which picks them up. Each box contains enough Intermediary to treat from one hundred to one hundred and fifty teeth.

Price - - - - - per box \$1.00

The S. S. White Dental Mfg. Co., Sole Agent

HOLLINGSWORTH'S SYSTEM

FOR

Crown= and Bridge= Work

Patented December 15, 1892; July 24, 1894

The Hollingsworth System of making crowns holds its own year after year because it affords the means for making artistic gold crowns and cusps by simple methods, adapted to the needs of the dentist. The variety of forms supplied assures the meeting of practically any case presenting.

Following the plain directions, the dentist will find no difficulty in arriving at accurate and artistic results. By the Hollingsworth System the following operations are performed with greater ease than by any other method:

Gold Crowns for Bicuspids and Molars

Gold Crowns for Incisors and Cusps

Solid Gold Cusps

Porcelain Facings

Facings for All-Gold Bridges

Grinding Surface of a Bridge in one Continuous Piece

The various folding cases in which the different sets of Cusp and Crown forms are sold are shown in pages following. Figures A to F show the simple special appliances required.

DIRECTIONS FOR EVERY DETAIL OF THE PROCESS ACCOMPANY EACH SET

The illustration of Set No. 1 shows the complete set of cusp and crown forms as they are put up for sale. In the upper half of the case there are 240 cusp forms and facings for Bicuspids and Molars; in the lower half there are 40 forms for Incisor and Cuspid Crowns.

From this great number, patterns can readily be selected that will perfectly articulate with the opposing teeth.

On the same page are shown—

Fig. A, the polished plate upon which the dies are made.

Fig. B, a carbon rod for pressing the melted metal into the asbestos mold.

Fig. C, part of the asbestos sheet, 7 x 10 inches, in which dies are formed for casting solid gold cusps.

Fig. D, a box of annealed copper strips for taking the measure of the root to be crowned.

Figs. E and F, rubber rings in which the die is made from Melotte's metal.

Set No. 2 contains cusp forms and facings for Bicuspids and Molar Crowns only.

Set No. 3 contains forms for Incisor and Cuspid Crowns only.

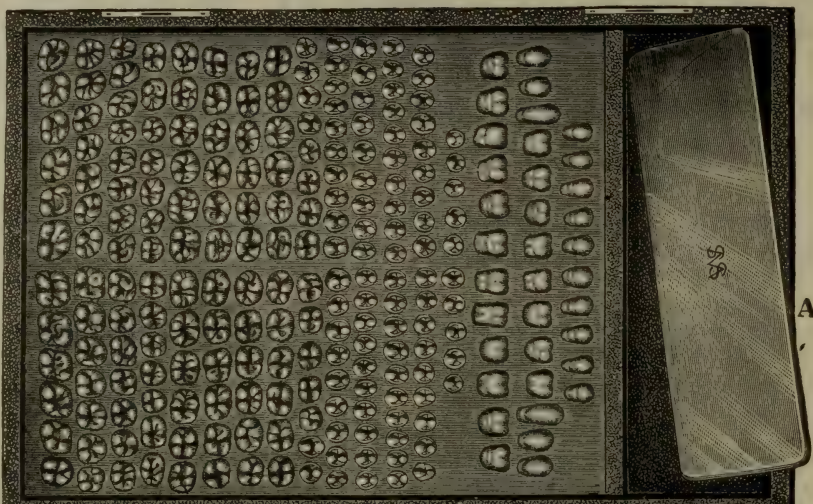
PRICES

Set No. 1	\$18.00
“ “ 2	13.00
“ “ 3	9.00
A.—Casting Plate .....	.75
B.—Carbon Stick .....	.06
C.—Asbestos Pad .....	.20
D.—Copper Strips	per box .12
E and F.—Rubber Rings	each .10

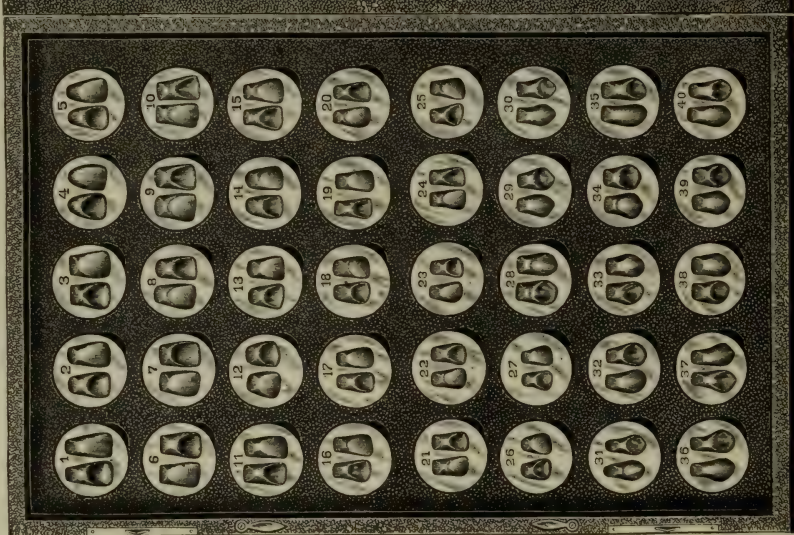
APPLIANCES FOR

HOLLINGSWORTH'S CROWN- AND BRIDGE-WORK SYSTEM

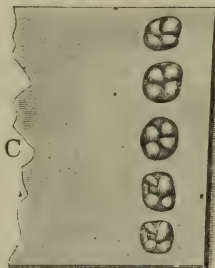
SET No. 1



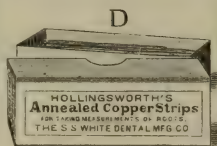
A



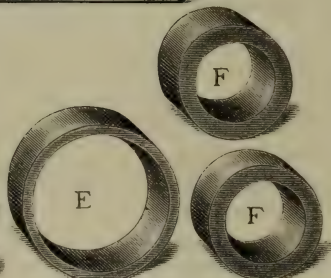
B



C

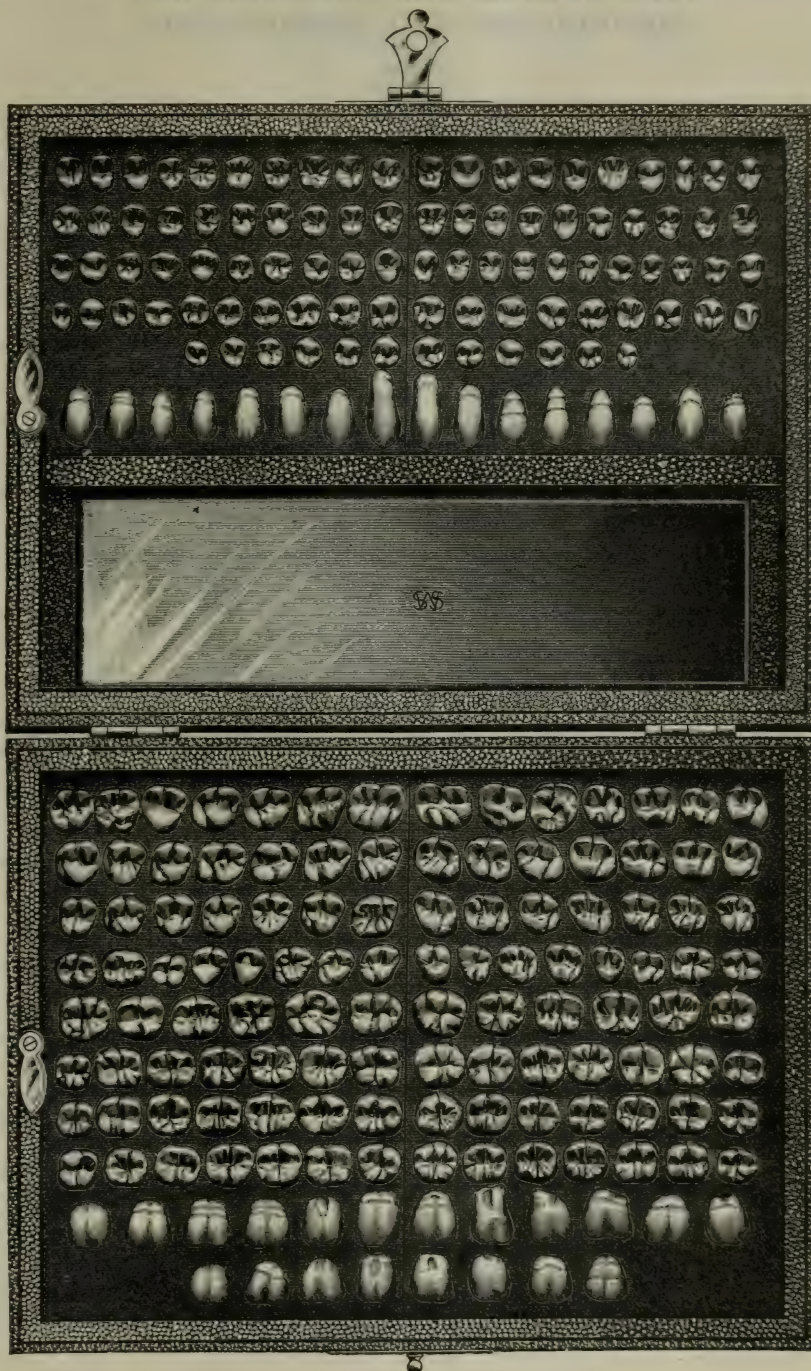


D



Price of Set No. 1\$18.00

APPLIANCES FOR
HOLLINGSWORTH'S CROWN- AND BRIDGE-WORK SYSTEM
 SET No. 2
 FOR BICUSPIDS AND MOLARS ONLY



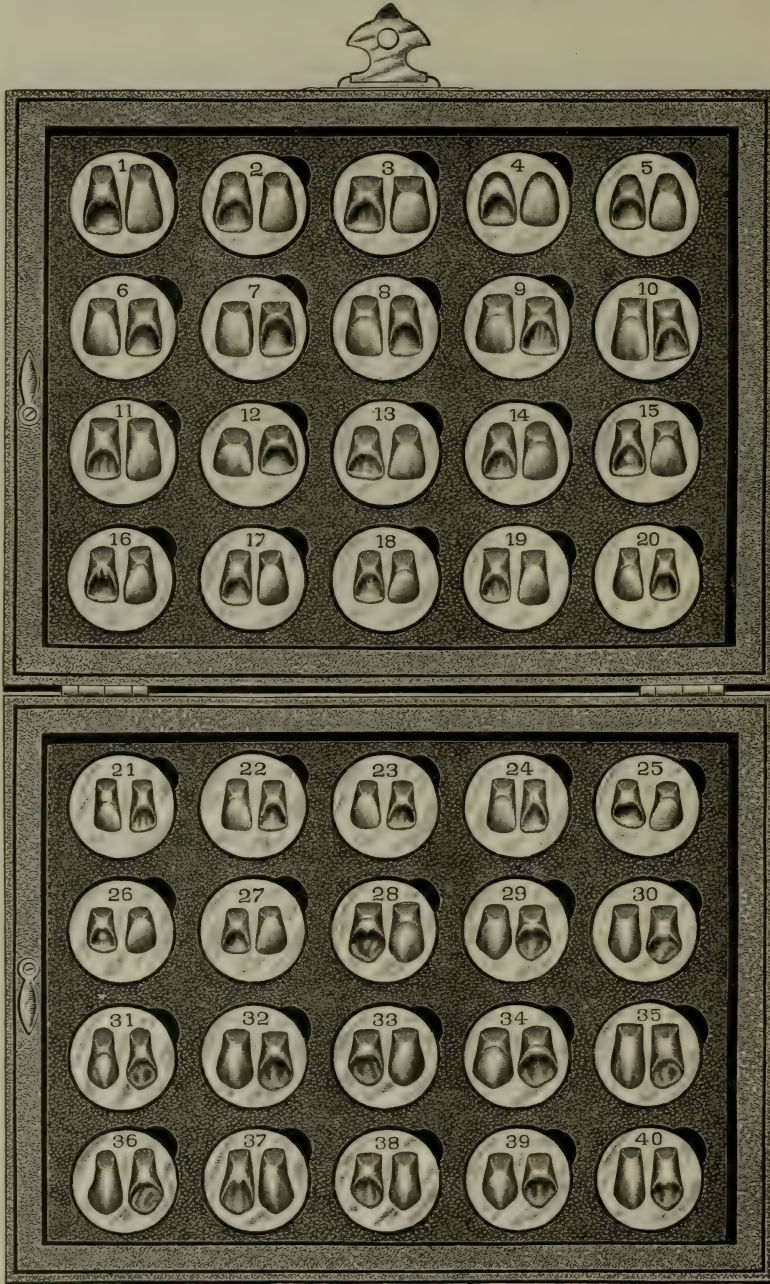
Set No. 2 includes appliances A, B, E, F, D, shown with Set No. 1, page 42.
 Price, Set No. 2.....\$13.00

APPLIANCES FOR

HOLLINGSWORTH'S CROWN- AND BRIDGE-WORK SYSTEM

SET No. 3

FOR INCISORS AND CUSPIDS ONLY



Set No. 3 includes one Rubber Ring F, page 42.
Price, Set No. 3.....\$9.00

The Hammond Electric Furnaces

Patented December 3, 1901, and February 10, 1903. In Great Britain, November 10, 1902
In Germany, November 11, 1902. In France, February 16, 1903. In Canada, May 12, 1903

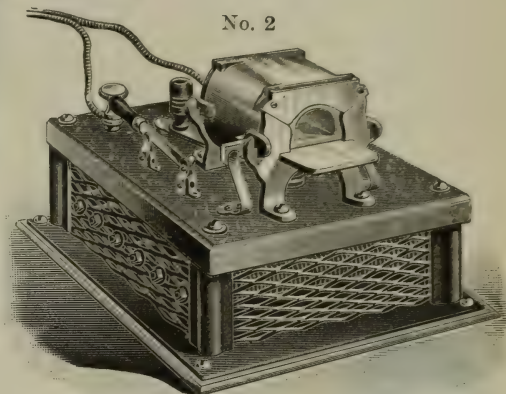
Furnace No. 2

For 110 to 120 Volts

Works high-, medium-, or low-fusing porcelain.
Wound for any current, direct or alternating,
from 52 to 220 volts.

Fuses the work uniformly throughout.
Is under easy and perfect control.
Entire apparatus compact and durable.
No dirt, no noise, no odor, no heat.

Four sizes.—No. 2 shown herewith is ample with
medium muffle for inlays, crowns, and bridges up
to eight or ten teeth.



No. 2 has three sizes of Muffle, which are interchangeable.

CATALOG FREE ILLUSTRATING AND DESCRIBING ALL FORMS

THE S. S. WHITE DENTAL MFG. CO., Sole Agent

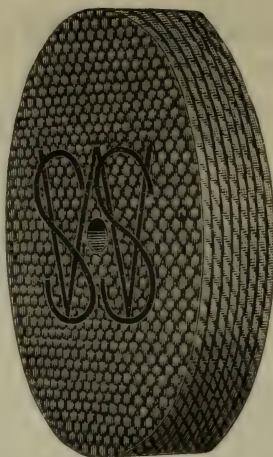
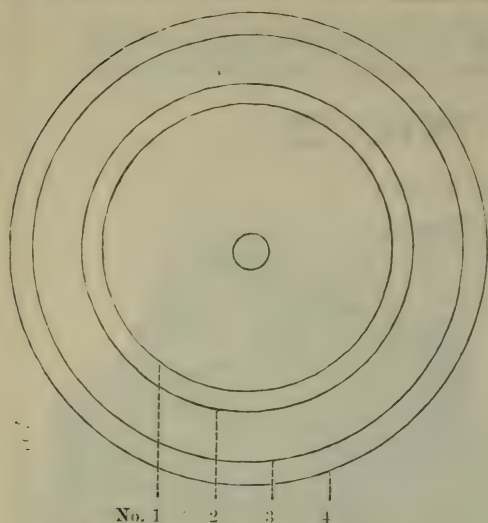
In going into Porcelain work, it is worth your while to get the best outfit. The Hammond Furnace is a part of that outfit. The necessary outfit is listed below, from a study of which you can see just what is involved in the way of expense for a good equipment.

List of Requirements for Beginners in Porcelain Work

1 Hammond Furnace No. 2, with Medium Muffle, say 110 Volts	\$45.00
1 Set $\frac{3}{8}$ Porcelain, A to Z, either High or Medium Fusing, including Outfit as follows:	
Inlay Carver No. 5, Locking Tweezers "K," Pipette Bottle, Spatula No. 13, and Shade	
Forms and Stand	12.50
1 Set $\frac{3}{8}$ Mineral Stains	5.00
1 Pair Inlay Matrix Pliers No. 60.....	1.75
3 Duffield's Inlay Matrix Swagers, at \$0.50.....	1.50
1 dwt. Platinum Foil (.001).....	1.40
2 Gem Cavity Trimmers, Nos. 2 and 5, at \$0.20 .....	.40
2 Arkansas Stone Points, Nos. 1 and 5, at \$0.50	1.00
2 Diamond Burs, 1 each Nos. 3 (\$0.75) and 11 (\$1.25)	2.00
7 LeCron Inlay Burnishers, Nos. 3, 5, 7, 8, 9, 10, 11, at \$0.35	2.45
1 Ebony-Handle Lancet No. 4 .....	.75
1 Harvard Quick-Setting Inlay Cement	1.25
1 Box Extra Fine Silex (1 lb.).....	.25
	<hr/>
	\$75.25
Hammond Furnace No. 1, say 110 volts.....	\$38.00
The same, with outfit as above.....	68.25

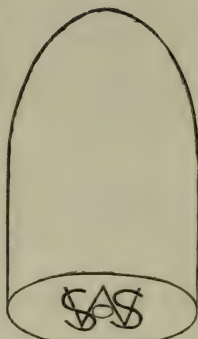
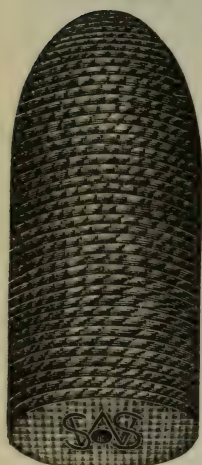
Cotton=Duck Wheels and Cones

Suggested by DR. J. H. MEASE



Cotton-Duck Wheels and Cones hold the coarser abrasives better than anything else we know of.

They are time-savers in cutting down a plate preliminary to the application of fine finishers.



PRICES

Wheels, No. 1, 1½ in. diameter...	each	\$0.10
" " 2, 1½ " " " "	"	.20
" " 3, 2¼ " " " "	"	.30
" " 4, 2½ " " " "	"	.40
Large Cones, 2 inches long, 1 inch diameter	"	.40
Small Cones, 1½ inches long, 1 inch diameter	"	.20
Extra Small	"	.10

Reduction TEETH REGULATION

WITH FINELY MADE

Original Devices Ready for Immediate Operative Application Without Soldering
NUMEROUS SPECIFIC ILLUSTRATIONS

By MILAND A. KNAPP, D.D.S.

Second Edition

THE S. S. WHITE DENTAL MANUFACTURING CO.

Publisher and Sole Agent

This book of seventy-five pages sets forth a new and practical system of teeth regulation, by appliances at once adaptable, without soldering and the necessary fitting to plaster models, or making bands to fit the teeth.

The illustrations and descriptions with references to the figures which identify the several parts, make plain their regulative action and enable the dentist to at once select by their numbers such parts as he may desire for the case in hand.

While the cost of the book is very small, it will prove of great value to the dentist.

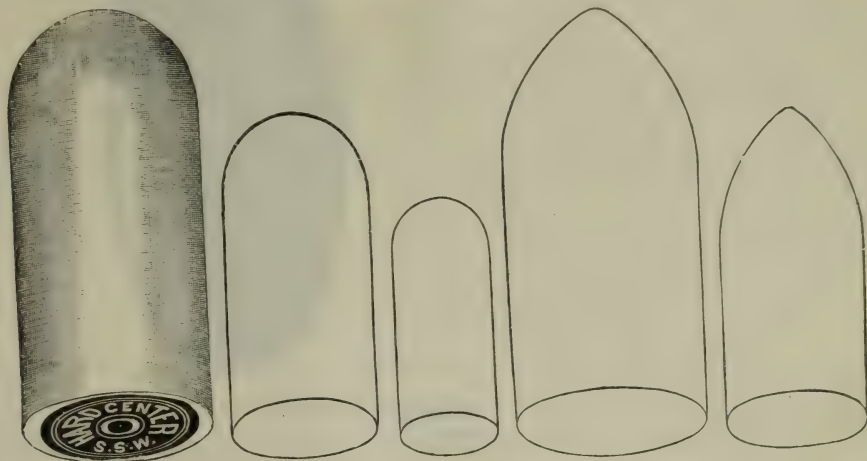
Price \$0.25

HARD CENTERS

Made of stock selected with a view to its special fitness for polishing: flexible, dense, and withal soft,—but not spongy.

CONES—BLUNT AND POINTED

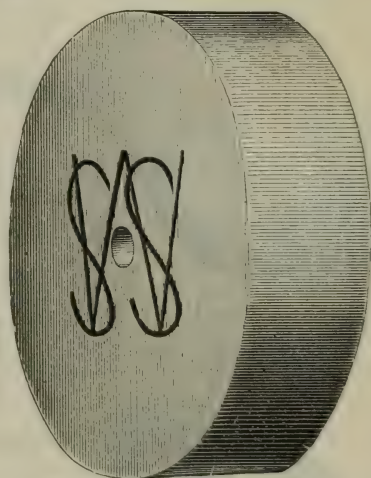
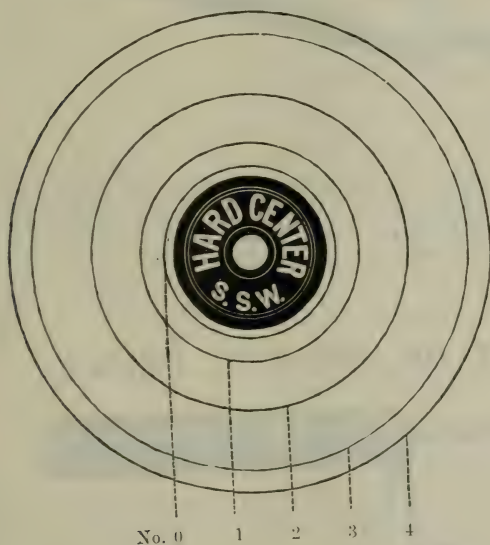
CONES—BLUNT AND POINTED



PRICES

	PRICES	
Large Felt Cone, 1 inch in diameter, Blunt or Pointed.....		each \$0.20
Small " " $\frac{3}{4}$ " " " " " "		" .10
Very Small Felt Cone, $\frac{1}{2}$ inch in diameter, Blunt (per doz. \$0.75)		" .07

WHEELS—SQUARE-EDGE



Represents No. 4 Wheel

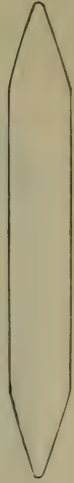
PRICES

Square-Edge	No. 0,	$\frac{3}{4}$ inch	diameter	.....	each	\$0.10
"	"	1, $1\frac{1}{8}$ inches	"	.....	"	.15
"	"	2, $1\frac{3}{8}$ "	"	.....	"	.15
"	"	3, $2\frac{1}{8}$ "	"	.....	"	.25
"	"	4, $2\frac{1}{4}$ "	"	.....	"	.25

FELT WHEELS—HARD CENTER

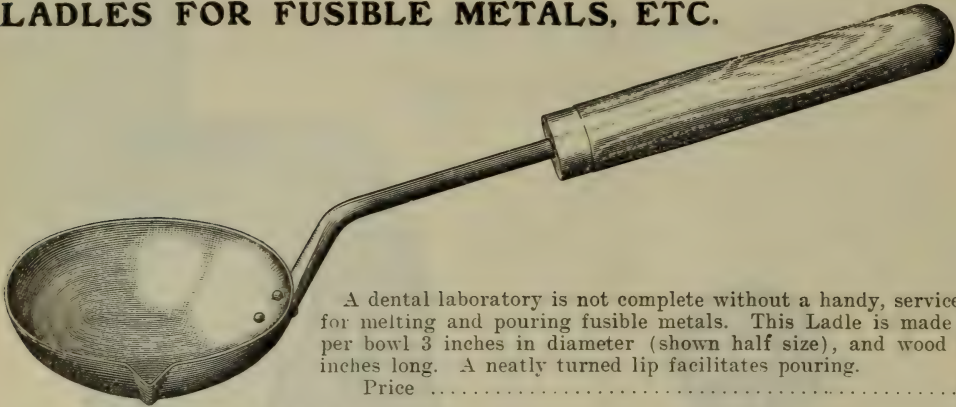
ROUND-EDGE

KNIFE-EDGE



	No. 1	2	3	4	PRICES
Round-Edge or Knife-Edge,	No. 1,	1 $\frac{1}{2}$	inches diameter.	each	\$0.15
"	"	2,	1 $\frac{3}{4}$	"	.15
"	"	3,	2 $\frac{1}{4}$	"	.25
"	"	4,	2 $\frac{1}{2}$	"	.25

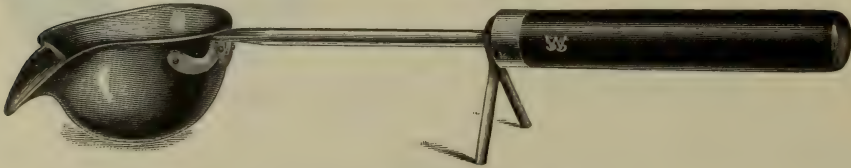
LADLES FOR FUSIBLE METALS, ETC.



A dental laboratory is not complete without a handy, serviceable ladle for melting and pouring fusible metals. This Ladle is made with copper bowl 3 inches in diameter (shown half size), and wood handle 7½ inches long. A neatly turned lip facilitates pouring.

Price\$0.35

LADLE DESIGNED BY DR. FRED A. PEESO



Actual size, 10½ inches long over all

This Ladle has a long, rather deep, rounded lip at right angles to the handle, so that it pours without spilling, no matter how full the bowl may be. It gives perfect control of the quantity of metal poured, and will deliver it in a very small ring, even when almost cold. The Bowl is made of copper. Every particle of the melted metal will run out without adhering to the side or bottom. It does not "tin." The Handle is supplied with legs, so that the Ladle can be set down without risk of being upset.

Price \$1.00

DENTAL MEDICATION

In pages following will be found a number of the standard preparations used in dental medication. They are arranged in alphabetical order, and their properties and uses are clearly noted so as to be seen at a glance.

All of these preparations may be relied upon as having been compounded carefully of pure drugs. Many of them are made specially for our sales.

ACID, CARBOLIC

Antiseptic, Disinfectant, Caustic, Local Anesthetic, Obtundent

The pure drug is a powerful caustic poison.

Used in solutions of varying strength, as a mouth-wash or gargle, as a dressing for root-canals and in the treatment of alveolar abscess, as a disinfectant of cavities before the final filling, etc. Also, as an obtundent for sensitive dentin.

Effective in the relief of odontalgia in decayed teeth.

Price1-oz. glass-stoppered bottle \$0.35

ACID, TRICHLORACETIC

Disinfectant, Deodorant, Caustic, Stimulant

Trichloroacetic acid in solutions of various strengths shows many qualities which adapt it to the needs of the dentist.

In $\frac{1}{2}$ to 1 per cent. solution it destroys the odor on opening into the root of a tooth with putrescent pulp, and purifies the contents almost in a moment.

Stronger solutions dissolve calculi on the roots of teeth, destroy pus-secreting surfaces on the sockets of teeth; have a strong caustic action on morbid growths on the mucous membrane, on excrescences of the pulp and overhanging gum over third molars. Trichloroacetic acid is almost a specific for the removal of hypertrophied gums.

In treatment of pyorrhea pockets trichloroacetic acid of various strengths has been used with success.

The solutions used range from $\frac{1}{2}$ per cent. up to 90 per cent. They are easily prepared, their strength being graduated by increasing or decreasing the quantity of water.

Price1-oz. vial \$0.60
" $\frac{1}{2}$ " " .20

CAMPHORATED PHÉNOL

Antiseptic, Local Anesthetic, and Germicide

This preparation of carbolic acid and camphor possesses characteristics differing radically from either of its components, the camphor moderating the caustic and disorganizing character of the carbolic acid without destroying its useful effects.

It is a colorless fluid of a somewhat oily character, having the odor of camphor, and is non-irritant and non-poisonous.

It is used as a sedative dressing in pulpitis, in the treatment of roots of teeth with putrescent pulps, and in disorders of the mucous membrane of the mouth. Also, very useful in case the operator cuts his fingers. In odontalgia caused by an exposed pulp its application gives immediate relief.

Price4-oz. bottle \$0.60

CREASOTE

Antiseptic, Germicide, Obtundent

Is known as a stimulant, sedative, rubefacient, escharotic, styptic, and antiseptic. As might be expected, it is useful in a multitude of difficulties, as for the relief of odontalgia, hypersensitive dentin, alveolar abscess, pericementitis, suppurating pulps, devitalizing pulps, etc.

Price1-oz. glass-stoppered bottle \$0.25

CREASOTE, PURE WOOD

Is a much finer grade than that previously mentioned, and is to be preferred for dental purposes.

Price1-oz. glass-stoppered bottle \$0.50

GLYCEROL (GLYCERIN)

Solvent, Emollient

As a solvent alone, and as both solvent and emollient when combined with other substances can be employed with great benefit in diseases of the mucous membranes of the mouth, as stomatitis, ulcers, aphthæ, alveolar abscess, abraded surfaces, etc.

Price 2-oz. bottle \$0.15
" 8 " " .40

LIQUID GUTTA=PERCHA

This solution is useful for relief of odontalgia arising from an exposed and inflamed pulp. Applied to inflamed or abraded surfaces it gives effective protection.

Price 1-oz. bottle \$0.40

HYDRONAPHTHOL

Powerful Antiseptic and Stimulant

A harmless, odorless disinfectant and preservative, possessing one-fifth the antiseptic strength of bi-chlorid of mercury, double that of iodoform, and fourteen times that of carbolic acid.

Price per 1-oz. bottle \$1.00

IODOFORM

Antiseptic, Anodyne, Stimulant

This drug is highly recommended as an antiseptic for dental purposes, either alone or combined with eucalyptus oil. Especially useful in the treatment of alveolar abscess or putrescent pulps. Also used as an anodyne following the extraction of teeth affected with pericementitis and alveolar abscess. The odor is readily disguised.

Price ¼-oz. bottle \$0.60

OIL OF CLOVES

Antiseptic, Anodyne, Germicide

A drop or two upon a pledget of cotton will relieve odontalgia; also employed for the same purpose in combination with morphia, sweet spirits of niter, etc. This oil may be substituted for creasote or carbolic acid; in equal parts it will make more pleasant the odor of these without interfering with their action.

Price ½-oz. bottle \$0.20

OIL OF EUCALYPTUS

Antiseptic, Anodyne, Germicide

Is antiseptic, disinfectant, sedative, tonic, diaphoretic, and somewhat astringent. Most effective in treatment of putrescent pulps, chronic alveolar abscess, pyorrhea alveolaris, ulcers, etc. It is a solvent of gutta-percha, and should be used cautiously in its vicinity.

Price \$0.50

OIL OF EUGENOL (C₁₀H₁₂O₂)

Antiseptic, Anodyne, Germicide

Is also known as eugenic acid, and is one of the active principles of oleum caryophylli. It has the odor of oil of cloves intensified, and may be diluted in water or alcohol; water is preferable. Applied to an exposed or nearly exposed pulp the pain is greatly lessened and frequently ceases after a minute or two. If the cavity has been washed with a solution of sodæ biboras previous to its application, it is probably the best dressing for a slightly inflamed or congested pulp. It may be injected through a fistulous tract and the root sealed at the apex immediately in all alveolar abscesses of recent occurrence, no further treatment being necessary; but it is imperative that the root should be thoroughly filled. As a dressing of root-canals after the removal of a recently destroyed pulp, it is used instead of the powerful coagulators of albumin. Diluted with water—1 part of eugenol to 1000—it is an elegant dressing injected into the pockets of pyorrhea, and may be substituted for H₂O₂ in cleansing the pockets. With proper precaution it may be injected full strength into a blind abscess. In such cases the root-canal should be sealed loosely with cotton saturated with it.

Eugenol in full strength will coagulate albumin. It is a powerful germicide, and not dangerous to human life.

Price 1-oz. bottle \$0.60

ROBINSON REMEDY

Obtundent, Escharotic, Anodyne

This well-known preparation (formula by Dr. Jeremiah Robinson) is an excellent obtunder for sensitive dentin; will usually insure a painless operation, but will not injure the hard tissues. In case of pulp exposure its application may at first be slightly painful, but an eschar forms so quickly and strongly that capping with any of the plastics may be at once proceeded with. It is almost a specific in the treatment of hypersensitive dentin. It also acts speedily and effectively in the treatment of pyorrhea.

Full directions accompany each bottle.

Priceper bottle \$0.50

TINCTURE OF ACONITE ROOT

Anodyne, Sedative, Depressant

This is the official preparation, which, when locally applied, checks inflammation in its early stages. With equal parts of Tincture of Iodin it is a valuable application in the incipient stages of pericementitis. Will relieve odontalgia and the pain following the extraction of a tooth. In alveolar abscess one drop of the tincture in water, every hour, will give relief. Not more than three doses should be given. Also useful, combined with chloroform, in treating irritated or inflamed pulps. In combination with other drugs it makes a good local anesthetic.

Price1-oz. bottle \$0.15

TINCTURE OF IODIN

Stimulant, Antiseptic, Counter-Irritant, Antiphlogistic

Is valuable in the treatment of pericementitis, alveolar abscess, mercurial stomatitis, inflammation and ulceration of the gums, fungous growths of gum or pulp, necrosed teeth and suppurating pulps, diseases of the antrum, caries of maxillary bones, dentigerous cysts, recession of gum, etc.

Price1-oz. glass-stoppered bottle \$0.25

DR. VEO'S REMEDY FOR PYORRHEA ALVEOLARIS

Styptic, Antiseptic, Germicide, Solvent, Obtundent, Tonic

Dr. Veo's Remedy contains the medicinal and germicidal properties of formaldehyd, eucalyptus, mentha piperita, calendula, cassia, thymol, camphor, cloves, beechwood creasote, sulphuric acid (10 per cent.) and solvents. It thus possesses all the essentials of a curative dressing for pyorrhea, in the treatment of which it has been very largely used. It stops the bleeding of the gums, destroys bacteria, prevents further infection, dissolves the deposits, deadens the pain, and tones up the tissues. It is invaluable also in the treatment of sensitive dentin, pulpless teeth, alveolar abscess, and bleeding from the gums from whatever cause.

Priceper bottle \$2.00

THE S. S. WHITE DENTAL MFG. CO., Sole Agent

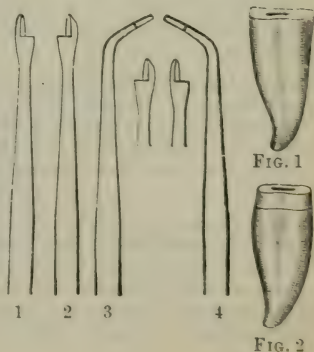
ROOT-TRIMMERS OR REDUCERS

Suggested by DR. R. WALTER STARR

For trimming the edges and reducing the diameter of roots over which collars are to be placed. The shoulder keeps the instrument on the root and limits the penetration of the spur, the knife-edge of which scrapes the side of the root, Fig. 1, so that it may easily and quickly be given the shape of Fig. 2, or any similar form. Made right and left; the straight pair, Nos. 1 and 2, for use on the superior roots anterior to the molars, and the curved pair, Nos. 3 and 4, for use on all the other natural roots.

Priceeach \$0.45

Made for Cone-Socket Handles only.



The S. S. White Dental Mfg. Co.'s

DENTAL BOOKS

Some of the Dental Books in the List below will certainly help you;
take a moment to run over the titles and make your selections

ABBOTT, FRANK.—Dental Pathology and Practice. By Frank Abbott, M.D., Professor of Dental Histology, Surgery, and Therapeutics in the New York College of Dentistry. Two hundred and thirty-seven pages, with ninety-seven illustrations and three plates.

Price\$2.50

AMBLER, H. L.—Tin Foil and Its Combinations for Filling Teeth. By Henry L. Ambler, M.D., D.D.S., Professor of Operative Dentistry and Dental Hygiene in the Dental Department of Western Reserve University, etc. One hundred and eight pages, illustrated.

Price\$1.00

ANGLE, E. H.—Treatment of the Malocclusions of the Teeth and Fractures of the Maxillæ. By Edward H. Angle, M.D., D.D.S., former Professor of Histology, Orthodontia, and Comparative Anatomy of the Teeth in the Dental Department of the University of Minnesota, etc. Sixth edition. Greatly enlarged and entirely rewritten. Three hundred and five pages and two hundred and ninety-nine illustrations.

Price\$4.00

BARRETT, W. C.—Oral Pathology and Practice. By W. C. Barrett, M.D., D.D.S., LL.D., Professor of the Principles and Practice of Dentistry and Oral Surgery in the University of Buffalo, Dental Department, etc. Second edition, revised, enlarged, illustrated. Three hundred and nineteen pages and one hundred illustrations.

Price\$3.00

BLACK, G. V.—Descriptive Anatomy of the Human Teeth. By G. V. Black, M.D., D.D.S. Fourth edition. One hundred and sixty-two pages and one hundred and forty-two illustrations.

Price\$2.50

CRYER, M. H.—Studies of the Internal Anatomy of the Face. By M. H. Cryer, M.D., D.D.S., Professor of Oral Surgery, Department of Dentistry, University of Pennsylvania. One hundred and seventy-six pages and one hundred and fifty-one illustrations.

Price\$1.50

EAMES, GEO. F.—The Practice of Dental Medicine. By George F. Eames, M.D., D.D.S., Professor of Pathology and Therapeutics in Boston Dental College, etc. Two hundred and fifty pages, thirty-eight engravings, and three colored plates.

Price\$2.75

EVANS, GEORGE.—Artificial Crown- and Bridge-Work and Porcelain Dental Art. By George Evans, Lecturer on Crown- and Bridge-Work in Baltimore College of Dental Surgery, etc. Carefully revised, with the addition of much that is new in both text and illustration. *Seventh edition in press.*

FLAGG AND INGLIS.—Dental Pathology and Therapeutics in the form of Questions and Answers. Compiled by Otto E. Inglis, D.D.S. Carefully revised and approved by J. Foster Flagg, D.D.S., Professor of Dental Pathology and Therapeutics in Philadelphia Dental College. Third edition. One hundred and five pages. Interleaved.

Price\$1.75

GUILFORD, S. H.—Orthodontia, Malposition of the Human Teeth. By S. H. Guilford, A.M., D.D.S., Ph.D., Professor of Operative and Prosthetic Dentistry in the Philadelphia Dental College; Author of "Nitrous Oxide," etc. Third edition, thoroughly revised. This edition has been thoroughly revised, and in every way it has been brought abreast with the most recent advances in the department of dental effort of which it treats.

Price, Clothnet \$2.25

HEWITT, F. W.—The Administration of Nitrous Oxide and Oxygen for Dental Operations. By Frederic W. Hewitt, M.A., M.D. *Third edition in press.*

JOHNSON, C. N.—Principles and Practice of Filling Teeth. By C. N. Johnson, M.A., L.D.S., D.D.S., Professor of Operative Dentistry in the Chicago College of Dental Surgery. Second edition, revised and enlarged. Two hundred and ninety-nine pages and one hundred and three illustrations.

Price\$2.50

MARSHALL, JOHN S.—Injuries and Surgical Diseases of the Face, Mouth, and Jaws. By John Sayre Marshall, M.D., former Professor of Dental Pathology and Oral Surgery, and Emeritus Professor of Oral Surgery of the Dental Department of Northwestern University, etc. Second edition, revised and enlarged.

PriceCloth \$5.50

"Sheep 6.50

MILLER, W. D.—The Micro-Organisms of the Human Mouth. The Local and General Diseases which are Caused by Them. By Willoughby D. Miller, D.D.S., M.D., Professor at the University of Berlin. Four hundred pages, one hundred and twenty-eight engravings on wood, one chromo-lithographic, and two photo-micrographic plates.

Price\$5.00

OTTOLENGUI, R.—Methods of Filling Teeth. By Rodrigues Ottolengui, M.D.S. Second edition, revised and enlarged. Two hundred and nineteen pages and two hundred and seventy-three illustrations.

Price\$2.00

RÖSE, C.—Instruction in the Care of the Teeth and Mouth. By C. Röse, M.D. (Munich). Thirty-eight illustrations. Translated from the third German edition.

Price\$0.20

DENTAL BOOKS—Continued

SMITH, A. HOPEWELL.—Dental Microscopy. By 'A. Hopewell Smith, L.R.C.P.Lond., M.R.C.S.Eng., L.D.S.Eng., late Assistant Demonstrator of Histology at Charing Cross Hospital Medical School. One hundred and ten pages, and eight lithographic plates from the Author's Original Drawings, and Full Index.

Price\$2.00

SMITH, A. HOPEWELL.—Histology and Patho-Histology of the Teeth and Associated Parts. By A. Hopewell Smith, L.R.C.P.Lond., M.R.C.S.Eng., L.D.S.Eng., Lecturer on Dental Anatomy and Physiology, Assistant Dental Surgeon and Demonstrator of Practical Dental Histology at the Royal Dental Hospital of London, etc. Six hundred and thirty-three pages.

Two colored plates and 493 illustrations in the text, including 300 original photo-micrographs by the Author.

Price\$8.00

THOMPSON, A. H.—A Manual of Comparative Dental Anatomy for Dental Students. By Alton Howard Thompson, D.D.S., Professor of Dental Anatomy, Human and Comparative, in the Kansas City Dental College. One hundred and seventy-six pages and forty illustrations.

Price\$1.50

WEBB, MARSHALL H.—Notes on Operative Dentistry. By Marshall H. Webb, D.D.S. One hundred and seventy-five pages, illustrated.

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DECORATED TOOTH-POWDER FLASK

FIG. 1

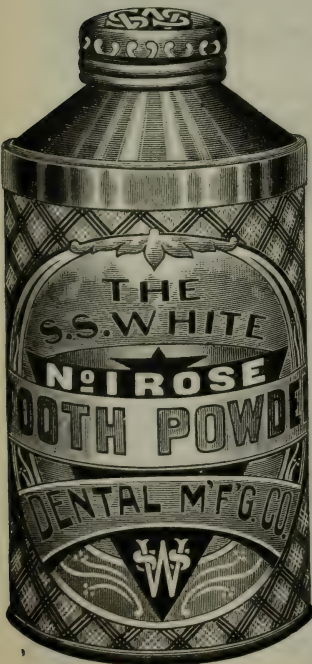
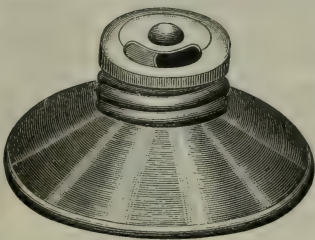


FIG. 2



This Flask has an adjustable opening in the top, by which the rate of discharge of the powder may be varied and controlled (see Fig. 2). A screw-cap fitting tightly over the top prevents waste or loss of the powder.

The Flask is made of the enameled metal so largely used of late years for similar purposes, is well constructed,

and will stand considerable hard usage.

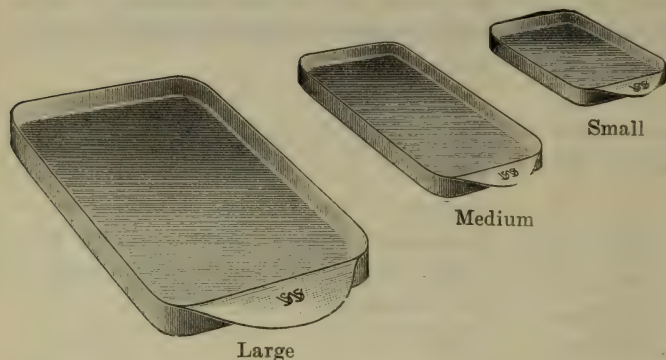
For travelers' use it thus has several advantages, not the least of which is the perfect closure secured by the screw-cap, by which the silting out of the powder to soil other articles in the traveling-bag is provided against. Equally useful as a powder holder for stay-at-homes. It holds something over two ounces.

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Filled with No. 1 Rose or Wintergreen, or Phenated Tooth Powder.

Each	\$0.25
Per dozen	2.00
" half-gross	10.00

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The Large size will carry bridges up to six or eight teeth, and can be used in the large muffle of the No. 2 or in the Nos. 3 and 4 Hammond furnaces.

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Prices subject to fluctuations of Platinum.

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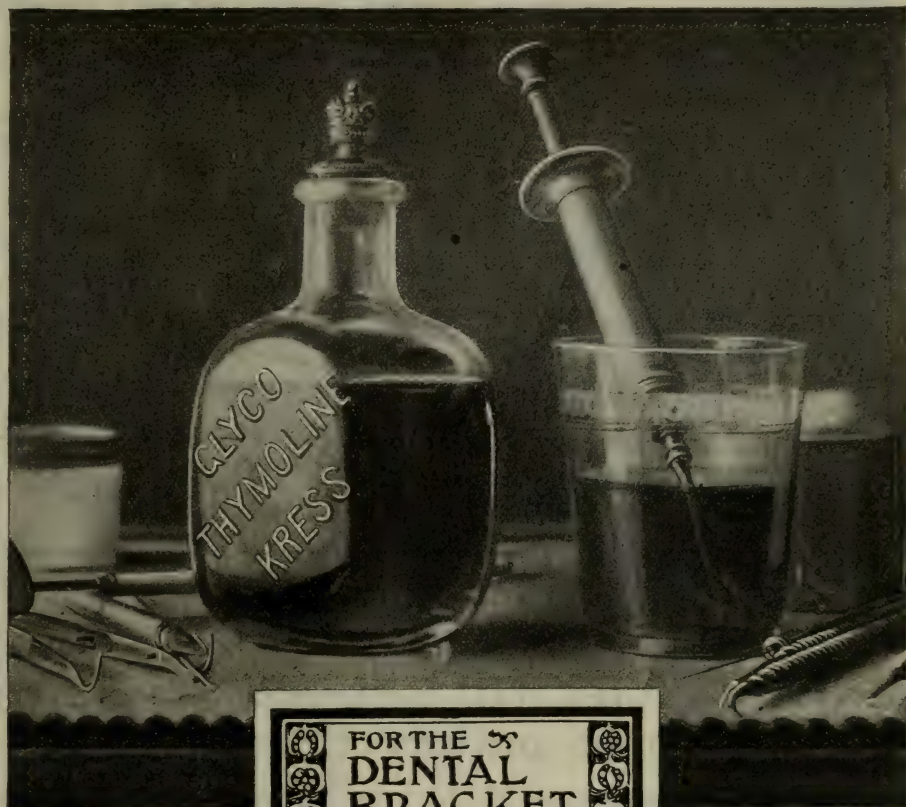
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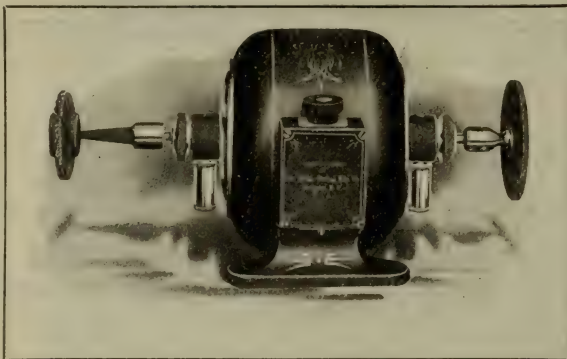
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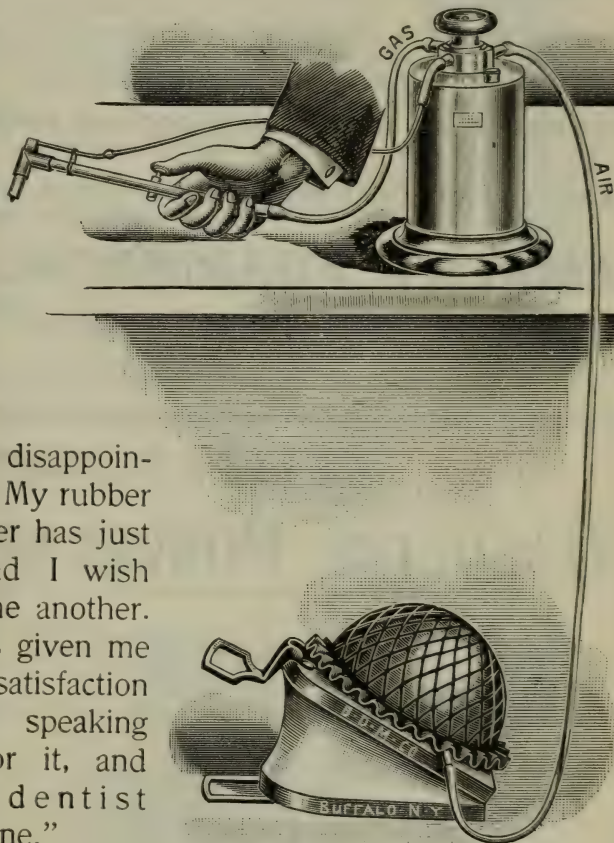
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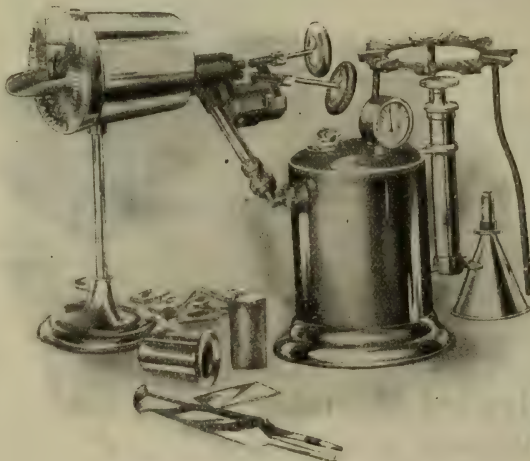
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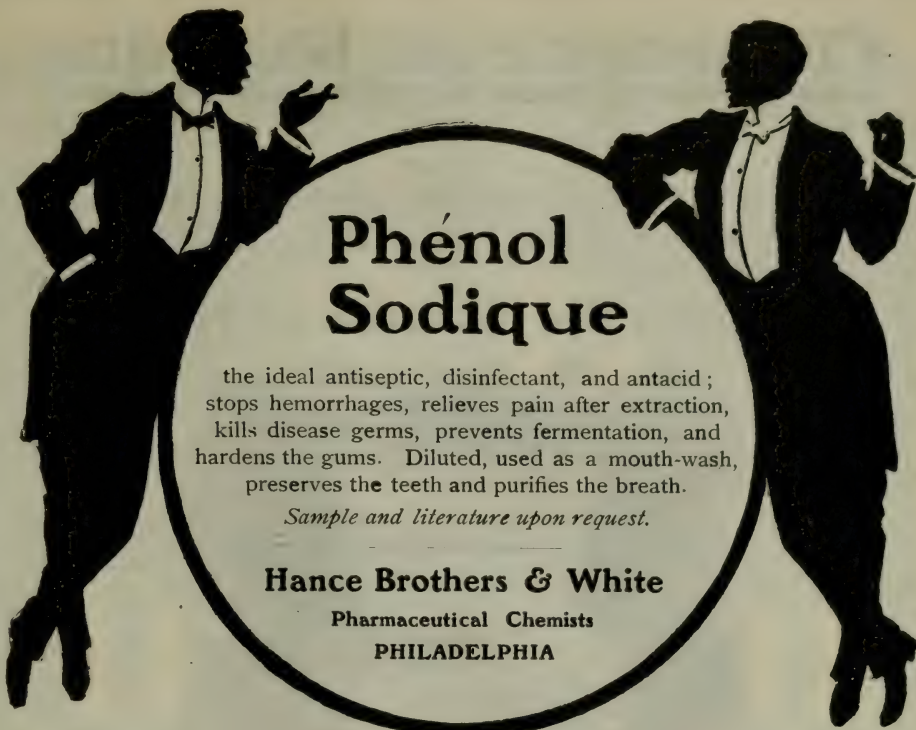
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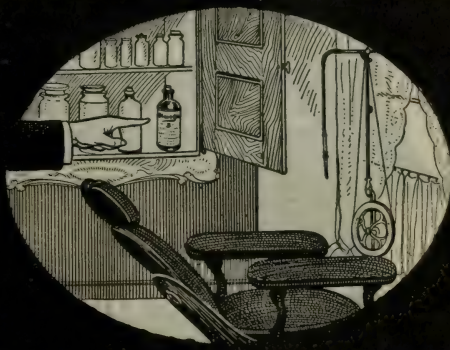
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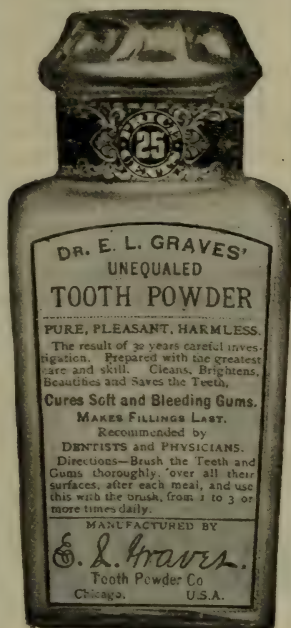
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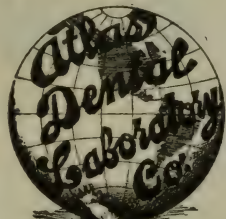
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There is a teaching force of twenty competent instructors. The clinic is abundant. The building is commodious and thoroughly equipped for the teaching of modern Dentistry.

The climate of Colorado for lung and kindred diseases is equal to any in the world.

This School is a member of the National Association of Dental Faculties and recognized by the National Board of Dental Examiners.

For information and Annual Announcement, apply to

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UNIVERSITY OF MARYLAND

DENTAL DEPARTMENT



HE regular Winter Session commences on October 1st of each year and ends in the following April.

The Annual Catalogue contains Courses of Study, etc. Attendance upon three regular winter sessions will be required before the final examinations for the degree of Doctor of Dental Surgery. Any candidate who may fail to pass the final examinations in April will have the privilege of a second examination in the following October without further attendance at a regular session. Graduates of medicine and those who have attended a recognized dental school for one or more sessions are admitted to higher grades on entering this school. The requirements for admission are the same as in all reputable dental colleges, and according to the rules of the National Association of Dental Faculties.

Matriculation fee, \$5; Tuition for each session, \$100; Graduation fee, \$30; Dissecting fee, second or third year, \$10.

For information and catalogue, address

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845 N. EUTAW STREET BALTIMORE, MD.

Harvard University, Dental Department

BOSTON, MASS.

The thirty-sixth annual session of this school begins September 29, 1904, and ends June 22, 1905, with a recess of one week at Christmas and another in April, making a school year of nine months of practically continuous work.

COURSE OF INSTRUCTION

FIRST YEAR: General Anatomy (including dissection of three parts), Physiology, Physiological Chemistry, Dental Chemistry, Hygiene, Histology, and Embryology.

SECOND YEAR: Bacteriology, Operative and Mechanical Dentistry (theory and practice), Crown and Bridge-Work and Metallurgy (theory and practice), Orthodontia (theory and practice), Dental Pathology, Oral Surgery, Materia Medica, and Therapeutics.

THIRD YEAR: Operative and Mechanical Dentistry (theory and practice), Crown and Bridge-Work and Metallurgy (theory and practice), Neurology, Surgical Pathology and Surgery, Orthodontia (theory and practice).

The University Degree D.M.D. (Dentariæ Medicinæ Doctoris) is conferred upon all who fulfill the requirements.

Graduates of recognized Dental Schools will be admitted to the courses of Operative and Mechanical Dentistry on payment of \$50 for each course for the whole or any part of the academic year.

FEES

There are no fees for matriculation, nor for the diploma, nor for the Demonstrators. For the first year the fee is \$200; second year, \$150; third year, \$150; for any subsequent year, \$50.

FOR FURTHER INFORMATION, ADDRESS

EUGENE H. SMITH, D.M.D., Dean, 283 Dartmouth St., Boston, Mass.

Pennsylvania

College of Dental Surgery

ELEVENTH AND CLINTON STREETS, PHILADELPHIA

FOUNDED 1856

The forty-ninth annual session will begin October 3, 1904.

The course of instruction covers three years of eight months in each year and is thorough, progressive, and practical. By lectures, demonstrations, laboratory experimentation, and continuous clinical practice, the student is fitted on graduation to enter at once on active professional work. Frequent quiz and review examinations are held throughout each session by the Faculty.

The College building has a complete modern equipment, and is located in one of the most quiet and refined residential districts in central Philadelphia.

Since its foundation, 2607 graduates have received the diploma of the school, the list of alumni being larger than that of any other dental college in the world.

For catalogue and further information, apply to

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New York College of Dentistry

1904-1905

39th COLLEGIATE YEAR

Infirmary Course

May to October 1904 (Optional and Free)

Lecture Session

October 3d, 1904, to June 5th, 1905 (Obligatory)

For admission, preliminary educational, curriculum and other requirements write for an announcement, addressing

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The fact that dentistry must be practically taught is fully recognized, the College Infirmary, a most complete, large, and handsome hall, being daily filled with clean and respectable patients, of a class nearly equal to those of the average dentist. The Infirmary is open all the year. For Summer Session, no charge to those who attend the following Winter Session.

The session begins October 1, closing in April. A large corps of demonstrators, always present, put in actual practice the teachings of all lectures in dentistry, leaving nothing undemonstrated. All methods are fully taught, all appliances and apparatus used;

the making of instruments and the most elaborate gold and continuous-gum work, and all the cases arising in ordinary practice, with many which are rarely seen, carefully demonstrated.

Commencing October 1, 1895, women will be admitted to this College, subject to the same requirements as men.

The College has formed an alliance with the College of Physicians and Surgeons by which its students are privileged to attend all lectures and clinics. The patients of this medical school numbered last year over 40,000.

The qualifications for entering the first year's course are in accordance with the resolutions adopted by the National Association of Dental Faculties.

TERMS OF GRADUATION.—Attendance on three winter courses of lectures in this College; as equivalent to one of these we accept one course in any reputable dental college. Graduates in Medicine can enter the Junior Class.

FEES.—Matriculation (paid once only), \$5.00. Tuition fee, \$100.00. Diploma fee, \$30.00. Dissecting fee, \$10.00.

Students corresponding with the Dean will please be careful to give full address, and direct their letters to

M. W. FOSTER, M.D., D.D.S., Dean, No. 9 W. Franklin St., Baltimore, Md.

PITTSBURG DENTAL COLLEGE



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Students are eligible to and participate in all features of university life common to the whole student body of the institution.

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Candidates for admission are required to present evidence of a preliminary education as follows:

A diploma of an approved high school having a three years' course or certificate showing three years' attendance at a high school having a four years' course

or certificate showing equivalent education. In lieu of such diploma or certificates, the applicant will be required to pass a matriculate examination equivalent to that forming the basis of the certificates of required preliminary education.

FEES

Matriculation Fee (paid once only)	\$5.00
Fee for One Course of Lectures	100.00
Dissecting Fee—First and Second Year, each.....	6.00
Graduation Fee	30.00

NOTICE.—Beginning with the session 1905-1906 the tuition fee for all new matriculates will be \$150 for each year of the course; and the present diploma fee of \$30 will be abolished in the case of all who come under this condition.

Board can be obtained at from five to eight dollars per week, according to location and accommodations

The Dental Department is located in "Dental Hall," the new building especially erected for its use. The facilities thus afforded are, it is believed, unequalled for securing an education complete in all departments of dental science and art. The clinical operating room is 180 by 50 feet, lighted on all sides, and furnished with 100 Wilkerson Chairs of latest pattern, especially constructed for the Department. Each operating chair has a fountain spittoon attached, also especially de-

signed and constructed for this Department. Electrical service is supplied to all chairs, and is of a character to cover all of the applications of electricity to dentistry. The Prosthetic Department is supplied with laboratory facilities devoted to every branch of the work. Prosthetic technic, in vulcanite and metal work, porcelain work, continuous-gum work, and crown and bridge work, is taught by modern methods in separate laboratories especially equipped for the

purpose. The laboratories are furnished with power lathes and with compressed-air apparatus for soldering and metallurgical operations.

The clinical patronage of the Department is always in excess of the needs of the students.

Oral surgical clinics, also general surgical clinics, are held twice a week.

Practical instruction in Chemistry, Metallurgy, Histology, Physiology, and Bacteriology is given in appropriately equipped laboratories.

The Dissecting-Room is large, well-lighted, thoroughly ventilated, and is furnished with ample material for the successful prosecution of anatomical studies.

The technic or manual training method of imparting instruction is developed in relation to all departments where it has been found applicable.

All of the departments of practical laboratory and clinical instruction are in charge of competent and

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The Dental Department of the University is an integral part of the University system. Its students at the discretion of the Dean are permitted to take courses of instruction in other departments of the University without additional fees, and are eligible to and participate in all those features of University life common to the whole student body of the institution. These include its athletic features and privileges of the Howard Houston Hall, the club house of an organization governed by the University students and having all of the appointments and desirable features of a strictly first-class club. The dormitories of the University are the best of their kind in this country, and to these the students of dentistry are admitted in common with the students of all the other departments.

THE ANNUAL SESSION

The session begins the last Friday in September, and ends at Commencement, the third Wednesday in June. (No student admitted to the regular course after October 10th.) The number of lectures per week, with a synopsis of the various branches taught, will be found in the General Catalogue.

The course of instruction will extend over a period of THREE YEARS.

In order to facilitate work in the practical branches, and to economize the student's time, the regular session is so arranged that students during the first year

are required to devote the time equally to DENTAL, HISTOLOGICAL, AND CHEMICAL LABORATORY WORK. During the second and third years the student has practically the entire forenoon of each day for dental work. Thus ample opportunity is afforded for practice in OPERATIVE AND MECHANICAL DENTISTRY. In the latter branches the students of the first year are divided into sections, devoting the time not otherwise engaged to practice in the operating rooms.

PLAN OF EXAMINATION

The gradation of the course enables the First-year student to present himself for examination in the following branches: CHEMISTRY, HISTOLOGY, and ANATOMY, including OSTEOLOGY and MYOLOGY. The second-year student will be examined in MATERIA MEDICA, BACTERIOLOGY, APPLIED ANATOMY, and PHYSIOLOGY, and on the progress in OPERATIVE AND MECHANICAL DENTISTRY. Such an arrangement is economical not only in point of time, but also in facilitating a student's acquirement of knowledge in the remaining branches.

The final examination at the close of the third year is in OPERATIVE DENTISTRY, MECHANICAL DENTISTRY, METALLURGY, CLINICAL DENTISTRY, DENTAL PATHOLOGY AND THERAPEUTICS, AND ORAL SURGERY.

All applicants for advanced standing must pass the required examination of this school, or furnish proof that they have passed EQUIVALENT examinations in some recognized dental or medical school. Graduates of a recognized medical college will be admitted to the second-year class without examination.

For detailed information and announcements, address

EDWARD C. KIRK, D.D.S., Sc.D., Dean of the Faculty of Dentistry

Dental Hall, Cor. 33d and Locust Sts., PHILADELPHIA, PA.

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Furnishing and equipment all new and modern.

A thorough didactic and practical course in all that pertains to dentistry.

Three annual courses of eight months each required for graduation.

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Entrance examinations will take place Monday, June 13, and Saturday, October 1, 1904.
Registration of students closes October 15, 1904, according to the requirements of the National
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For further information or catalogues address the Secretary,

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